

Master Thesis

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Abstract

This thesis explores how the type of coaching, human, AI-based, or hybrid, influences athletes' perceptions of emotional support and how these perceptions, in conjunction with individual support expectations, affect client retention. Drawing on Expectancy Disconfirmation Theory, the study investigates both the absolute level of perceived emotional support and the alignment between expected and received support across different coaching modalities. A quantitative, cross-sectional survey was conducted with 120 athletes, and multiple regression analyses were used to test six hypotheses. The findings show that coaching type significantly influences perceived emotional support, with human coaches rated highest, followed by hybrid and AI-based formats. However, coach type did not moderate the relationship between emotional support and retention intention. Instead, emotional support itself emerged as a strong predictor of retention across all formats. Furthermore, misalignment between expected and received emotional support, regardless of direction, was negatively associated with retention. Contrary to expectations, athlete typology (recreational vs. semi-/professional) did not moderate this relationship, suggesting that emotional needs are widely shared across competition levels. These results contribute to theory by extending Expectancy Disconfirmation Theory to the domain of AI-supported sports coaching and by highlighting emotional support as a format-independent mechanism of client retention. From a practical perspective, the findings emphasize the need for coaching providers and technology developers to embed empathy, responsiveness, and expectation management into coaching systems.

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Figure 1: Theoretical model

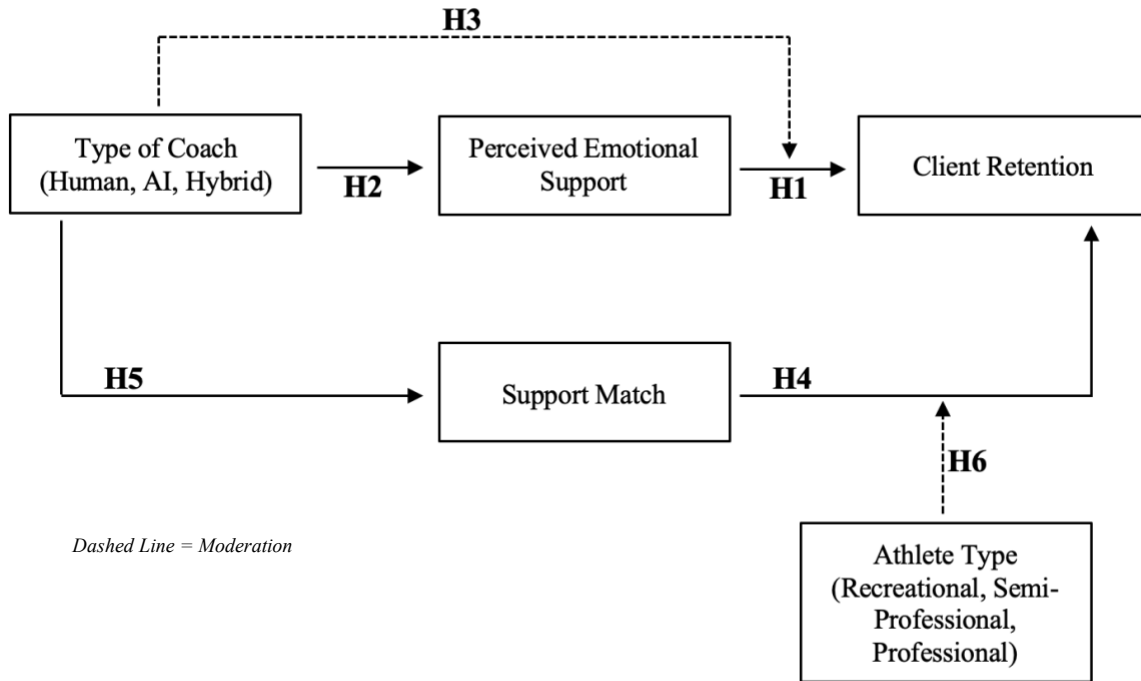


Table 1: Descriptive Statistics

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
EmoSupport_Received	120	1.00	7.00	5.1300	1.20633
EmoSupport_Expected	120	1.75	7.00	5.2750	1.16875
SupportMatch	120	.00	4.85	.9008	.90862
RetentionIntention	120	1.00	7.00	5.0917	1.34568
Valid N (listwise)	120				

Table 2: Correlations

		Correlations			
		EmoSupport_R eceived	EmoSupport_E xpected	RetentionInten tion	SupportMatch
EmoSupport_Received	Pearson Correlation	1	.425**	.783**	-.367**
	Sig. (2-tailed)		<.001	<.001	<.001
	N	120	120	120	120
EmoSupport_Expected	Pearson Correlation	.425**	1	.484**	-.252**
	Sig. (2-tailed)	<.001		<.001	.006
	N	120	120	120	120
RetentionIntention	Pearson Correlation	.783**	.484**	1	-.264**
	Sig. (2-tailed)	<.001	<.001		.004
	N	120	120	120	120
SupportMatch	Pearson Correlation	-.367**	-.252**	-.264**	1
	Sig. (2-tailed)	<.001	.006	.004	
	N	120	120	120	120

** . Correlation is significant at the 0.01 level (2-tailed).

Summary of key findings

Model	Description	Supported?
Model 1	<i>H1: Perceived emotional support received is positively associated with retention intention.</i>	Supported
Model 2	<i>H2: The type of coach (human, AI, hybrid) has a significant effect on perceived emotional support.</i>	Supported
Model 2	<i>H3: Coach type moderates the relationship between perceived emotional support and retention intention.</i>	Not Supported
Model 3	<i>H4: The absolute difference between emotional support received and expected is negatively associated with retention intention.</i>	Supported
Model 3	<i>H5: Support match mediates the relationship between coaching type and retention intention.</i>	Not Supported
Model 4	<i>H6: Athlete type (recreational, semi-professional, professional) moderates the relationship between support match and retention intention.</i>	Not Supported

Table 21: Summary of Results

Introduction

In recent years, artificial intelligence (AI) has increasingly reshaped athletic coaching within the fitness landscape. AI is becoming a central player in how athletes track their performance and structure their training plans. Traditionally, coaching has relied heavily on human expertise, where emotional support, motivation, and personal interaction were a central part to athlete development and retention. However, data-driven AI coaching platforms, such as ZING, TriDot, or other similar systems, are challenging the assumption that human connection is essential to effective coaching. While AI-based systems offer advantages in cost efficiency, personalization, and scalability, they raise questions about their ability to provide the emotional depth often associated with human coaching relationships. Emotional support plays an important role in athlete satisfaction, psychological resilience, and long-term commitment to a training plan (Lundqvist & Raglin, 2014; Kuok et al., 2021; Watson et al., 2024). As these AI systems continue to gain popularity, it becomes pressing to assess whether they can fulfil these psychological and emotional needs in a way that athletes perceive as genuine and supportive. For SMEs in the sports coaching sector, this shift presents risks and opportunities. AI coaching tools, on the one hand, can scale a business while reducing costs as tracking athletes' performance does no longer need a human coach. On the other hand, if it fails to deliver adequate emotional engagement, it could reduce user satisfaction and cause clients to drop out. Understanding not only whether athletes feel supported, but whether the support they receive matches their personal needs and expectations, becomes critical. Emotional misalignment, where athletes need more support than they receive, may undermine the effectiveness of AI coaching and lead SMEs to lose clients to competitors offering more relational depth.

Consequently, examining how coaching type (human, AI-based, or hybrid) influences athletes' perceived emotional support, as well as how well that support aligns with their individual needs, is central to understanding what drives retention within modern coaching environments. While this shift raises practical concerns for SMEs, it also reveals an underexplored academic question: can AI-based coaching systems meet the emotional needs of athletes in ways that foster retention, as human coaches traditionally have?

The effectiveness of AI coaching has been widely examined in terms of performance optimisation, and injury prevention, demonstrating its potential to enhance training efficiency and accessibility (Huang et al., 2024). At the same time, emotional support has long been recognised as a key component of effective coaching, contributing to athlete motivation, satisfaction, and long-term commitment (Lundqvist & Raglin, 2014). However, what remains underexplored is how different coaching formats, whether human, AI-based, or hybrid, influence athletes' perception of emotional support, whether that support aligns with their individual needs, and how this alignment ultimately affects their intention to stay in a coaching program. The aim of this thesis is to investigate how the type of coaching, whether human, AI-based, or hybrid, influences athletes' perceptions of emotional support, and how these perceptions, in combination with athletes' individual emotional needs, affect their intention to remain in a coaching program. By comparing the support athletes feel they receive to the level of support they believe they require and how this influences their intention to stay in the coaching program, this research aims to reveal the emotional dynamics shaping retention in increasingly digitised training environments. So in other words, this study contributes to the literature by applying emotional support and expectancy alignment to the under-researched field of AI-based coaching.

Main Research Question

How does the type of coaching (human, AI-based, or hybrid) shape athletes' perceptions of emotional support, and how do these perceptions, alongside individual support needs, affect client retention?

To address the research questions, this thesis employs a quantitative research design, utilising a cross-sectional online survey. The survey targets athletes who are currently engaged in coaching programs delivered by either human coaches, AI-based systems, or a combination of both. The remainder of this thesis is structured as follows: Chapter 2 reviews relevant literature, Chapter 3 details the methodology, Chapter 4 presents the results, and Chapter 5 discusses the findings and their implications.

Literature Review

Section 1: Emotional Support in Coaching

Emotional support in the context of sports coaching refers to the provision of care, empathy, and psychological safety that creates a sense of connection and trust between coach and athlete. It differs from other forms of support, such as informational or instrumental support, which focus on performance guidance or practical aid, respectively (Spruijtenburg et al., 2025; Ferreira et al., 2024). While instrumental support involves logistical assistance, such as equipment or scheduling, informational support provides tactical feedback and emotional support, which explicitly targets athletes' psychological well-being and motivation.

Given its distinct psychological focus, emotional support plays a unique role in shaping athletes' subjective experiences within the coaching process. Coussens, Stone, and Donachie (2025) emphasize that perceived emotional support has a direct impact on self-confidence and psychological resilience, particularly in high-performance or emotionally demanding environments. Similarly, Martinelli et al. (2016) argue that even when technical guidance is present, a lack of emotional sensitivity can lead to stress, particularly during the recovery period following an injury. These findings suggest that emotional support functions not just as a supplement to performance coaching but as a fundamental pillar in athlete development and well-being.

Central to this dynamic is the coach-athlete relationship, which serves as the primary conduit for delivering emotional support. This relationship is not only defined by communication style but grounded in relational processes like trust, empathy, and attentiveness. Both Magrum and McCullick (2019) and Jowett and Ntoumanis (2003) emphasise the importance of these dynamics, highlighting how emotional attunement enables coaches to create a psychologically secure environment for athletes. The Coach-Athlete Relationship Questionnaire (CART-Q), developed by Jowett and colleagues, formalises this relational quality into three key dimensions: closeness, commitment, and complementarity. These are underpinned by mutual trust, emotional availability, and responsiveness (Jowett & Lavallee, 2007). A critical aspect of this emotional responsiveness is empathic accuracy, which refers to the coaches' ability to perceive and interpret their athletes'

emotional states accurately. Lorimer and Jowett (2009) argue that this capability enables deeper trust and more tailored support, particularly when athletes are under stress or emotional strain. Lane (2024) reinforces this point by noting that in high-performance contexts, where mental pressure is intense and errors carry even higher stakes, emotionally attuned coaching becomes essential for sustaining athlete motivation and resilience. These findings are underlined in qualitative studies with Olympic medallists, who consistently cite open communication and emotional trust as foundational to their long-term coach relationships (Jowett & Cockerill, 2002). Similarly, research by Sullivan and Gee (2007) finds that the emotional tone of coach-athlete interactions is a strong predictor of both team cohesion and individual athlete satisfaction.

This relational support does not only shape interpersonal bonds, but it also feeds directly into motivational mechanisms. In line with Self-Determination Theory (SDT), emotional support fulfills the psychological need for relatedness, which promotes intrinsic motivation and long-term sport engagement (Lundqvist & Raglin, 2014). Within this framework, relatedness refers to the desire to feel connected, understood, and cared for by others. Empirical studies further affirm this relationship: Kuok et al. (2021) and Watson et al. (2024) find that athletes who perceive strong emotional support from their coaches report higher levels of resilience, life satisfaction, and psychological well-being. The broader motivational climate also plays a critical role in mediating the effects of emotional support. Lochbaum and Sisneros (2024), in a recent meta-analysis, demonstrate that autonomy-supportive coaching environments, so those that allow athletes to feel emotionally safe, heard, and respected, are strongly associated with positive psychological outcomes. In contrast, Bartholomew et al. (2010) demonstrate that coaching environments characterized by psychological control, conditional regard, and micromanagement significantly undermine athletes' autonomy, mental health, and engagement. These controlling behaviours are measured using the Controlling Coach Behaviors Scale (CCBS), which highlights the detrimental effects of emotionally coercive coaching on athlete motivation.

Recognizing its importance, sport psychology has developed several tools to systematically assess emotional support. The Perceived Available Support in Sport Questionnaire (PASS-Q), for instance, includes an emotional support subscale that captures athletes' perceptions of being emotionally cared for and listened to by their coaches (Simons & Bird, 2022). Broader tools such as the Sport Mental Health Assessment Tool 1 (SMHAT-1) further integrate emotional support as a key component in assessing athlete well-being, linking emotional care to indicators such as mood, stress, and coping (Anderson et al., 2023; Bjsm, 2023). These instruments reflect a growing effort to translate emotional support from a conceptual ideal into a measurable and actionable construct.

Building on this measurable foundation, emotional support has emerged as a powerful predictor of long-term athlete retention. Studies show that athletes who perceive strong emotional backing are more likely to remain engaged with their training programs. Coussens, Stone, and Donachie (2025) find that emotional care enhances psychological stability and self-confidence, two predictors of sustained training commitment. Simons and Bird (2022) add that emotional reassurance helps athletes cope with performance-related stress, reducing dropout risk. Shi et al. (2025) identify psychological mechanisms such as self-efficacy and mental toughness as mediators between emotional support and training adherence, demonstrating that supportive coaching environments foster inner resources needed for long-term engagement. In sports contexts and increasingly digital coaching environments, where sustained adherence is crucial, the role of emotional support becomes even more critical. Coaches who fail to address athletes' emotional needs may jeopardize retention, regardless of the technical quality of their programs. As digital and AI-assisted formats grow in prevalence, the challenge of delivering emotional support in scalable ways becomes central to understanding coaching effectiveness. Emotional support thus emerges not only as a facilitator of short-term outcomes but as a strategic resource for maintaining athlete commitment over time.

Accordingly, this thesis proposes the following hypothesis:

H1: Perceived emotional support received is positively associated with retention intention.

Section 2: Human–AI Interaction and Digital Emotional Support

Artificial intelligence (AI) is increasingly transforming the landscape of sport and fitness coaching, offering scalable and data-driven alternatives to traditional human-led methods. Across various disciplines, AI-powered platforms such as HumangoAI, Garmin Coach, and TrainerRoad automate key coaching functions including personalised training plan generation, performance monitoring, and real-time feedback (Song, 2025; Symons, 2025). These tools rely on biometric and behavioural data to adapt routines dynamically, aiming to enhance training efficiency while reducing the need for ongoing human intervention. This technological shift is particularly appealing to recreational athletes and small to medium-sized enterprises (SMEs), which often face constraints in terms of cost and coaching capacity. For these groups, AI provides 24/7 accessibility, cost-effective scalability, and the ability to personalise at volume, factors that support growth without proportional increases in human labour (Matic, 2024; Vosed et al., 2023). Even in team environments, AI applications such as Pixellot offer automated video analysis for tactical planning and injury prevention, suggesting a broader integration of AI into both individualised and collective training contexts (Tyco, 2024).

While the performance benefits of AI coaching are widely recognised, its increasing presence in emotionally sensitive domains raises new questions about the relational qualities of digital coaching. As Kitson (2025) observes, the “art” of coaching is progressively giving way to a data-centric model in which optimisation is paramount. Yet, this science-driven paradigm may come at the expense of emotional nuance, especially in contexts where interpersonal trust, empathy, and motivational encouragement are core to the coaching experience. These concerns have begun to crystallise around the concept of social presence, defined as the extent to which users perceive AI systems as emotionally responsive and socially engaging (Oh et al., 2018). High social presence has been associated with enhanced user acceptance in emotionally charged environments such as education, therapy, and fitness coaching, where relational warmth can influence psychological engagement.

Empirical evidence further illustrates that AI can simulate socially supportive behaviours, at least to some degree. Sharma et al. (2022) show that just-in-time AI prompts can elevate perceived

empathy in peer support exchanges, while Kolomaznik et al. (2024) find that socio-emotional design features improve collaboration and perceived safety in human–AI teams. However, such effects appear limited and often superficial. Huang and Chang (2024) reveal that although students appreciate the functionality of AI tutors, they struggle to perceive them as emotionally trustworthy, reflecting a shallow and transient emotional bond. This relational asymmetry, so AI’s inability to adapt emotionally in nuanced ways, remains a critical limitation (Abedin et al., 2022). Moreover, the emotional simulation AI offers may create misleading perceptions of authenticity. Darling (2015) warns that anthropomorphism can lead users to attribute social qualities to machines, yet these impressions fade as the underlying limitations become apparent.

The psychological implications of extended AI interaction further complicate its use in emotional domains. Hall (2025) reports higher loneliness and emotional dependency among frequent users of conversational agents, while Dehnert (2023) highlights that AI lacks the capacity to co-construct meaning or establish genuine mutuality, an essential feature of emotionally rich human relationships. As Bickmore and Picard (2005) note, even advanced relational agents struggle to maintain user engagement over time, often leading to eventual emotional detachment due to their inability to exhibit sustained interpersonal awareness. These limitations become particularly salient in coaching environments where sustained motivation, psychological safety, and relational trust are central to long-term engagement. Although AI can support technical training needs, its inability to convey authentic care may compromise its perceived emotional adequacy.

This relational limitation is most clearly observed in the domain of trust, a foundational condition for perceived emotional support. Nong and Platt (2025) find that over half of respondents in a large-scale U.S. study express low trust in AI’s emotional suitability within healthcare settings, citing concerns about ethical integrity and emotional harm. These reservations extend to coaching, where athletes depend on their coach not just for technical guidance but also for emotional stability and support. Trust in AI remains fragile and is contingent on several variables: transparency, consistency, and explainability of decision-making processes have been shown to influence user acceptance (Afroogh et al., 2024; Ashoori & Weisz, 2019). Moreover, individual characteristics such as statistical literacy affect trust calibration, with analytically skilled users more likely to

scrutinise AI decisions in emotionally ambiguous contexts (Marmolejo-Ramos et al., 2025). Importantly, trust is not automatically granted in emotionally sensitive roles, it is earned over time through meaningful interaction and moral appropriateness, especially in domains traditionally governed by human empathy and ethical judgment (Sethumadhavan, 2018).

In addition to competence, users also assess the relational intent of AI systems. Perceived care, the belief that the system genuinely prioritises the user's well-being, emerges as a critical determinant of trust. Du et al. (2024) show that users question the moral accountability of AI, even when the system delivers accurate advice. Similarly, Shevtsova et al. (2024) find that users are more likely to engage emotionally with AI when it is framed as a supplement to, rather than a substitute for, human care. However, emotional design can backfire if the AI's outputs reflect bias or reinforce exclusionary patterns. Cerf (2025) warns that training data limitations may cause AI to unintentionally reproduce stereotypes or omit marginalised emotional narratives, reducing trust in emotionally sensitive applications. This suggests that trust in AI emotional support relies not only on functional reliability but also on relational framing and intent.

Despite technological advances in natural language processing and affective computing, AI systems still fall short in providing context-sensitive emotional responsiveness. They struggle with sarcasm, cultural nuance, and dynamic emotional adaptation, traits that are crucial for meaningful human interaction. Purdy, Zealley, and Maseli (2019) caution that these deficiencies can result in emotional misalignment, eroding user trust and satisfaction. Furthermore, Luger and Sellen (2016) compare AI assistants to "bad personal assistants", technically capable but emotionally tone-deaf, highlighting the discrepancy between functional output and relational engagement. Attempts to bridge this gap through anthropomorphic design do not resolve the core problem, as AI cannot genuinely feel or engage in moral reasoning (Priestley, 2023; Carroll, 1997; Goswami et al., 2024). These deficiencies limit AI's capacity to function as a credible emotional agent in coaching environments.

In comparative studies between AI and human coaching, these emotional limitations become even more pronounced. Terblanche et al. (2022) find that while both coaching formats improve goal

attainment, AI does so primarily through task-focused feedback, with little impact on emotional bonding. When AI chatbots are integrated into coaching sessions, as shown by Terblanche, Van Heerden, and Hunt (2024), they can even disrupt the working alliance between coach and client, by making interactions feel mechanical or impersonal. Bachkirova (2024) argues that AI lacks “real intelligence,” including moral discernment and empathic attunement, both of which are vital for supporting athletes through moments of emotional vulnerability or identity conflict.

However, the emergence of hybrid coaching models suggests a potential path forward. Mai and Richert (2020) demonstrate that combining AI with human coaching can enhance overall effectiveness, particularly when each format is used strategically. In these models, AI manages data-heavy tasks such as progress tracking, while human coaches deliver relational and emotional support. This symbiotic approach preserves the emotional richness of human interaction while leveraging AI’s analytical strengths, offering a more balanced and scalable coaching solution. For SMEs seeking to expand their services without sacrificing emotional quality, hybrid formats may thus represent the most promising route.

Taken together, the evidence suggests that coaching format significantly affects how emotional support is perceived by athletes. While AI offers substantial functional advantages, its relational shortcomings may undermine its effectiveness in emotionally supportive roles. Understanding how athletes experience emotional support across coaching formats is essential for developing retention-oriented coaching models that balance efficiency with psychological care.

Accordingly, this thesis proposes the following two hypothesis:

H2: The type of coach (human, AI, hybrid) has a significant effect on perceived emotional support.

H3: Coach type moderates the relationship between perceived emotional support and retention intention.

Section 3: Support Expectation vs. Support Received

Expectation–Disconfirmation Theory (EDT) offers a compelling framework to understand how individuals evaluate emotionally supportive interactions, particularly within coaching relationships. Rooted in consumer satisfaction research, EDT posits that individuals assess experiences based on the alignment between expectations and actual outcomes (Churchill & Surprenant, 1982). Positive disconfirmation arises when experiences exceed expectations, yielding satisfaction; conversely, negative disconfirmation results when expectations are unmet, often triggering dissatisfaction. This logic has been widely extended into emotionally nuanced contexts such as teletherapy and digital coaching, where emotional expectations weigh heavily in shaping outcomes (Lankton et al., 2013; Venkatesh & Goyal, 2010).

Within digital services, particularly those involving emotional and relational dynamics, EDT highlights that affective misalignments can be just as detrimental as functional shortcomings. Lankton and McKnight (2012) demonstrated the asymmetry of expectation disconfirmation: underperformance generates stronger negative responses than overperformance yields positive effects. Further developments of the theory show that trust moderates the effect of expectation disconfirmation in emotionally sensitive applications, including AI-based coaching (Lankton, McKnight, Wright, & Thatcher, 2016). When emotional expectations are met, even in the presence of minor technical shortcomings, users are more forgiving, whereas relational disappointments more acutely affect satisfaction and behavioural intent (Lankton, McKnight, & Thatcher, 2013).

This evolving perspective positions emotional support match as a central variable in the evaluation of coaching relationships. A support match, or the degree to which perceived emotional support aligns with what athletes expect, functions as a core mechanism within EDT's evaluative framework. By measuring the absolute difference between support received and expected, researchers can assess not only whether emotional needs were addressed, but to what extent the relational experience confirmed or disconfirmed user expectations. In this way, support match incorporates the disconfirmation logic at the heart of EDT, while contextualising it in terms of emotional quality and relevance.

Psychological literature reinforces the idea that perceived support often outweighs actual support in determining emotional and behavioural outcomes. Lakey and Cohen (2000) argue that perceived emotional support functions as a stable cognitive belief system, more predictive of well-being and stress regulation than objective measures of received support. Similarly, Uchino (2009) highlights that perceived support maintains a stronger link with long-term health than received support, especially when emotional processing is involved. While actual support behaviours remain important, especially in structured environments like coaching, their effectiveness is ultimately filtered through athletes' internal interpretations (Cutrona & Russell, 1990; Schwarzer & Knoll, 2007).

Poorly matched emotional support, even when present, can create unintended consequences. Studies by Shakespeare-Finch and Obst (2011) and Schwarzer and Knoll (2007) show that misaligned support often increases stress and decreases satisfaction. This principle has also been validated in clinical and health contexts: Linden and Vodermaier (2011) found that cancer patients who experienced a discrepancy between desired and perceived support reported significantly higher levels of distress. Similarly, Reynolds and Perrin (2004) observed that breast cancer patients who received poorly timed or irrelevant support reported weaker psychosocial adjustment, suggesting that even well-intended help can backfire if not attuned to the recipient's actual emotional needs. These findings substantiate the importance of integrating support match into the EDT framework, as both the presence of support and its perceived fit with individual needs influence satisfaction and, by extension, retention intentions. Emotional support that fails to resonate with the athlete's internal expectations can feel irrelevant or even burdensome.

In digital coaching environments, this challenge is particularly important. Platforms that offer technically correct feedback but fail to meet emotional expectations may create a dissonance between received support and user satisfaction. Studies in telehealth (Kruse et al., 2017) and digital education (Liu et al., 2024) reveal that relational sensitivity is often lacking in automated systems, even when technical outputs are accurate. This misalignment can reduce adherence, lower motivation, and ultimately lead to disengagement. Nguyen et al. (2022) further note that emotional

disconnection in digital contexts disproportionately affects users from marginalised groups, underscoring the social risks of emotional misfit.

The domain of AI coaching demonstrates similar patterns. Plotkina and Ramalu (2024) find that while AI chatbots deliver structured guidance effectively, they fall short in fostering emotional engagement. Athletes expecting empathetic or nuanced feedback often experience these interactions as emotionally flat or impersonal. Camacho et al. (2023) and Meyer et al. (2022) show that tailored emotional interventions, those that align with user-specific needs, enhance retention and satisfaction in digital health and coaching services, reinforcing the premise that emotional fit is a stronger predictor of outcomes than standardised support.

Misalignment between expected and received emotional support can have cascading effects. Research in sport psychology illustrates that mismatched support can erode trust, reduce motivation, and increase the risk of dropout. Fraser-Thomas, Côté, and Deakin (2007) found that unmet developmental needs are a key predictor of youth athlete attrition. Stephen, Habeeb, and Arthur (2021) identify that mismatches in perceived efficacy between coach and athlete increase anxiety, undermining emotional safety. Furthermore, Jiahao and Jing (2024) report that training satisfaction, linked to perceived support alignment, predicts burnout levels. When emotional support is seen as too distant, too intense, or mistimed, athletes may withdraw, despite the presence of high-quality training content.

Nevertheless, even coaches are affected, as Guzmán, Kingston, and Grijalbo (2015) highlight that relational frustration on the coach's side, when athletes appear emotionally disengaged, can lead to coach burnout and withdrawal. Gu et al. (2023) show that a sense of thriving, which mediates athlete engagement, is heavily influenced by perceived relationship quality and support alignment. These findings demonstrate that emotional misfit impacts both sides of the coaching dynamic and jeopardises long-term relational sustainability.

Taken together, the literature makes clear that the alignment between emotional support expected and received is a decisive factor in coaching retention. This alignment, or the support match, may not only mediate the relationship between coach type and retention intention but may also reflect the broader logic of EDT by capturing how emotional experiences are evaluated and acted upon.

Accordingly, this thesis proposes:

H4: The absolute difference between emotional support received and expected is negatively associated with retention intention.

H5: Support match mediates the relationship between coaching type and retention intention.

Section 4: Athlete typologies and emotional needs

Athlete typologies, typically defined by competition level and psychological traits, play a critical role in shaping expectations for coaching relationships and emotional support. Elite athletes often demonstrate higher levels of emotional control, conscientiousness, and stress resilience, which reflect both psychological development and adaptation to performance pressures (Mitić et al., 2021; Piepiora et al., 2024). These traits co-evolve with a shift in goals: while recreational athletes tend to pursue sports for enjoyment, well-being, or personal expression, elite athletes typically orient themselves toward mastery, achievement, and efficiency (Piepiora, 2024; Piermattéo et al., 2018). Nevertheless, elite status does not exempt athletes from psychological vulnerability. In fact, performance anxiety, perfectionism, and identity stress often heighten emotional strain among high-level performers (Tubić et al., 2022). Even within elite groups, psychological profiles diverge. Some athletes display robust self-regulation, while others are more susceptible to burnout or emotional depletion, underscoring the need for tailored emotional interventions (Chrétien et al., 2024). This heterogeneity suggests that athlete typologies should not be treated as fixed categories but rather as evolving psychological systems shaped by individual development, contextual demands, and interpersonal expectations.

Motivational dynamics similarly vary by athlete type. Autonomy-supportive environments are known to enhance mental well-being and persistence, but the mechanisms through which this occurs differ across populations. While recreational athletes may rely more on external reinforcement and relational coaching to sustain motivation, elite athletes often benefit from greater strategic independence, goal ownership, and instrumental feedback (Mossman et al., 2022; Cherry, 2025). Wang and Demerin (2023) observed that intrinsic motivation and flow are particularly prominent in experienced athletes within individual sports, further reinforcing the role of context and personal history in shaping engagement.

These motivational differences influence how athletes respond to coaching models. Elite athletes often expect structured feedback and competence-supportive leadership, while recreational athletes value emotional closeness and interpersonal warmth (Mertens et al., 2018; Brinton et al., 2017). Emotional support remains relevant at all levels, but its form may vary: for experienced

athletes, respect, clarity, and reliability can substitute for overt emotional expressiveness, whereas novices may require more direct reassurance and bonding (Moen, 2014; Longakit et al., 2024). Despite this gradient, relationship quality and trust continue to serve as universal predictors of athlete engagement and thriving (Gu et al., 2023).

The way emotional support is perceived and integrated also differs based on athletes' coping strategies and emotional regulation capacities. Recreational athletes tend to rely more on external emotional support and guidance to buffer against anxiety and stress, whereas elite athletes draw on sophisticated internal coping mechanisms, including visualization, breathwork, and cognitive reappraisal (Orbach & Blumenstein, 2022; Robazza et al., 2023; Yu et al., 2024). However, even for elite performers, relational trust remains vital. Jowett (2007) highlights the role of closeness and mutual respect in coaching relationships, and Wachsmuth et al. (2020) emphasize that high-level athletes prefer clearly defined relational boundaries that still preserve affective depth. These preferences complicate the design of coaching systems, especially digital and AI-driven models, which may struggle to adapt emotional responsiveness to diverse athlete needs.

The implications of these findings are central to understanding retention in coaching programs. As support expectations and emotional processing vary across athlete typologies, so does the impact of support on retention behavior. A mismatch between the type of support delivered and the athlete's implicit needs could lead to disengagement, even if the program is structurally sound or technically competent. For instance, an AI-driven coaching system that emphasizes strategic feedback may satisfy elite athletes but leave recreational users emotionally undernourished. Conversely, a relationally rich interface may appeal to novices but be perceived as inefficient or intrusive by professionals.

Thus, the effectiveness of emotional support, and its ability to drive retention, is not universal but contingent on athlete type. This leads to the following hypothesis:

H6: Athlete type (recreational, semi-professional, professional) moderates the relationship between support match and retention intention.

Theoretical Framework

The conceptual framework (see Figure 1) illustrates the proposed relationships between key constructs in this study. At its core, the model examines how the type of coach (human, AI, or hybrid) influences the level of perceived emotional support (H2), which in turn affects athletes' intention to remain engaged in a coaching program (H1). A central mechanism in this process is the alignment between emotional support expected and received, referred to as 'support match', which is posited to mediate the relationship between coach type and retention intention (H5). The model further assumes that coach type not only influences the degree of emotional support perceived, but also moderates how strongly this perceived support impacts retention (H3); for example, emotional support from human coaches may be more impactful than similar support from AI-based systems. In addition, the model introduces athlete type (recreational, semi-professional, or professional) as a moderating variable that shapes the effect of support match on retention (H6).

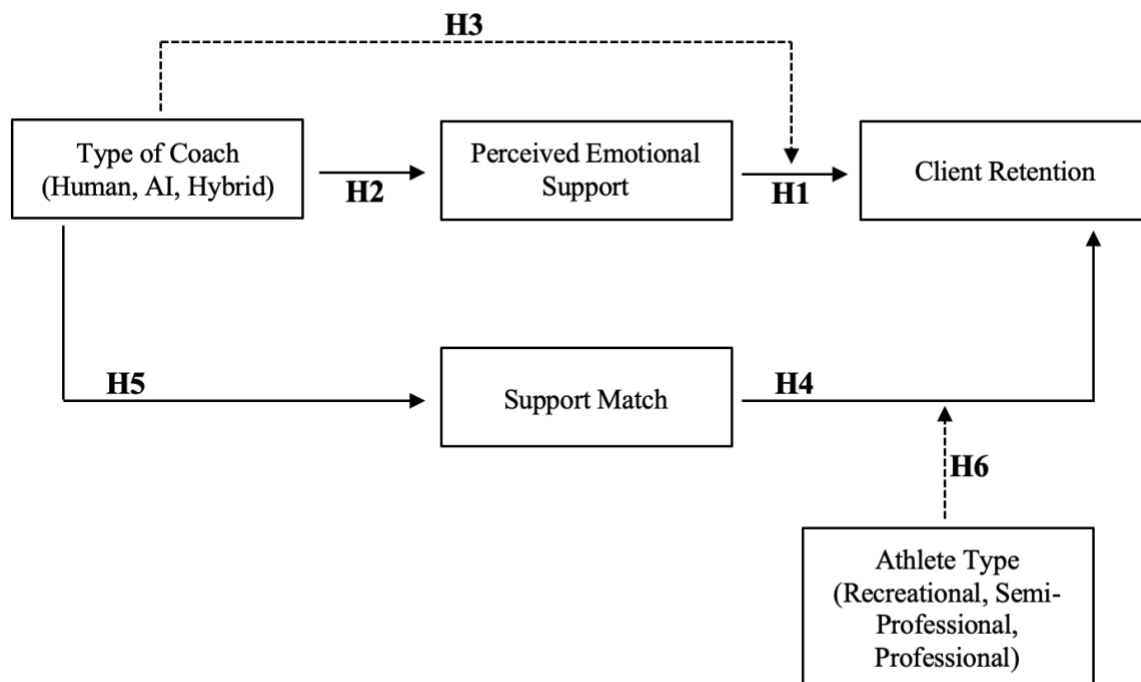


Figure 2: Theoretical model

Methodology

Research design

This study adopts a quantitative, cross-sectional research design to explore how different types of coaching, human, AI-based, or hybrid, affect athletes' perceptions of emotional support and their intentions to continue the coaching relationship. The use of a survey-based approach is appropriate for capturing subjective evaluations such as perceived emotional support, retention intention, and the alignment between expected and received support.

The study is explanatory in nature, aiming to examine theoretically informed relationships among variables derived from prior literature. The cross-sectional format was chosen for its efficiency in collecting data from a diverse sample at a single point in time. While this design does not permit causal inference in a strict sense, it is well-suited for identifying associations and interaction patterns between coaching type, emotional support, and athlete retention.

To enhance contextual relevance, the research focuses on athletes who are affiliated with small and medium-sized coaching providers, where new forms of digitally supported coaching are increasingly prevalent. This emphasis ensures the study is aligned with real-world developments and provides actionable insights for practitioners and researchers navigating the evolving coaching landscape.

Participants and Sampling

The target population for this study consisted of adult athletes with recent or current experience in endurance, strength, or fitness coaching, delivered either by human coaches, AI-based systems, or a combination of both. The goal was to capture a diverse yet relevant sample to assess perceptions across different coaching modalities.

A non-probability purposive sampling strategy was employed to identify participants who met the following inclusion criteria:

- Aged 18 years or older;
- Having been coached by a human, AI, or hybrid system within the past 12 months;
- Sufficient English proficiency to complete the survey.

Recruitment was carried out through targeted outreach in communities where coaching was already being practiced. This included endurance coaching businesses, AI-based coaching platforms, and hybrid systems. In particular, support was obtained from:

- Wagner Sports, a family-run endurance coaching business that shared the survey with human-coached athletes;
- The AI-based platform HumangoAI, whose ambassadors distributed the survey internally;
- Simple Endurance Coaching, a hybrid coaching service that collaborates with AthleticaAI, which also helped disseminate the survey.

This sampling approach ensured the inclusion of athletes with direct experience of the coaching types under investigation. While the sample was not probabilistic, the strategic targeting of knowledgeable subgroups increased the relevance and validity of the collected responses.

The final sample size (N = 120) was determined after excluding incomplete or invalid submissions.

Survey Design and Data Collection

The survey was developed and administered using Qualtrics, a secure and user-friendly online platform suitable for academic data collection. The structure of the questionnaire was informed by the conceptual framework and aimed to capture athletes' perceptions, experiences, and demographic background in a logically sequenced and user-friendly format.

The survey was divided into the following main sections:

1. Informed Consent

Participants were first presented with a consent form outlining the purpose of the study, data handling procedures, and the voluntary nature of participation. Only respondents who agreed to the consent terms were able to proceed.

2. Coaching Format and Athlete Profile

Respondents were asked to identify the primary format of their coaching (human, AI-based, or hybrid) and to self-categorize their athlete type (recreational, semi-professional, or professional). These items were used to create key independent and moderator variables.

3. Perceived and Expected Emotional Support

This section contained items assessing emotional support received and emotional support expected from the coach or system. The questions were phrased to allow application across both human and digital coaching contexts.

4. Retention Intention

Two items captured the athlete's likelihood to continue with their current coaching provider, reflecting commitment and satisfaction with the relationship.

5. Demographics

Participants were asked to provide optional background information including age, gender, and country of residence. These data were used for descriptive purposes only and not included in hypothesis testing.

6. Open Comment Field

An optional open-ended question invited participants to share their goals and additional thoughts on their coaching experience, enriching the contextual understanding of the responses.

Pilot Testing

Prior to distribution, the survey underwent internal pilot testing to assess technical functionality, clarity of item wording, and logical flow. Minor revisions were made based on feedback from test respondents to improve readability and ensure correct branching logic.

Sampling Strategy and Data Collection

A purposive sampling strategy was employed to recruit athletes with relevant coaching experience. The survey was shared through coaching communities, professional networks, and sport-specific online groups, with a focus on endurance sports and strength training disciplines. This included distribution through:

- A human-coaching-based endurance sports business,
- The AI-driven platform HumangoAI, via internal ambassador groups,

- The hybrid coaching network of AthleticaAI, supported by affiliated coaches like Paul Warloski.

This targeted recruitment ensured relevance to the study's focus while providing diversity in coaching experiences. The survey was live for three weeks in May 2025, during which 120 valid responses were collected. After closing, the dataset was exported to SPSS for screening and analysis.

Ethical Considerations

This study was conducted in accordance with the ethical guidelines of Maastricht University and the broader principles outlined in the Declaration of Helsinki for research involving human participants. Given the nature of the study, surveying adult athletes about their experiences with coaching, the ethical risk was minimal but nonetheless carefully addressed throughout the research process.

Informed Consent

Before beginning the survey, participants were presented with a detailed informed consent form outlining the purpose of the study, the voluntary nature of participation, the right to withdraw at any point, and information regarding data confidentiality. Only participants who actively agreed to these terms could proceed to the questionnaire.

Anonymity and Confidentiality

The survey was conducted anonymously using Qualtrics. No identifying information such as names, email addresses, or IP data was collected. All responses were stored securely and handled in a manner that protected participants' identities throughout the project. The dataset used for analysis was fully anonymized before being transferred to SPSS.

Data Protection

All data were stored in compliance with the General Data Protection Regulation (GDPR). Access to raw data was restricted to the researcher and academic supervisors. Files were stored on encrypted, password-protected devices and will be deleted upon project completion.

Sensitivity and Risk

The content of the survey was designed to minimize any psychological discomfort. No questions were asked about physical or mental health conditions, and the subject matter focused on professional and athletic experiences in a neutral tone.

Measures and Operationalization

All key constructs in this study were assessed via self-report items administered in an online survey. For ‘Perceived Emotional Support Received’ and ‘Emotional Support Expected’ validated scales from the sport psychology and coaching literature were adapted to fit the context of AI and hybrid coaching environments. All items were rated on a 7-point Likert scale (1 = Strongly Disagree, 7 = Strongly Agree).

1. Perceived Emotional Support Received

Perceived Emotional Support Received was assessed using five custom-developed items reflecting the extent to which athletes felt emotionally understood, encouraged, and cared for in their coaching relationship. While no single validated scale captures emotional support across both human and AI-based coaching settings, item development was informed by the emotional support dimension of the PASS-Q by Freeman et al. (2011) and the closeness dimension of the CART-Q by Jowett & Ntoumanis (2004). These instruments emphasize core emotional components such as empathy, encouragement, and affective connection, which this study adapted to suit a broader digital coaching context.

2. Emotional Support Expected

Expected Emotional Support was measured using four items developed specifically for this study. These items capture the athlete’s subjective need for empathy, encouragement, and emotional understanding within the coaching relationship. Item development was informed by the “Need for Support” subscale of the Berlin Social Support Scales (Schulz & Schwarzer, 2003).

3. Retention Intention

To assess the athlete's commitment to continue working with their current coach or system, two items were used (e.g., "I intend to continue with this coach/system in the future"). These items capture behavioral intention and long-term engagement.

4. Coach Type

Participants were asked to indicate who their primary coaching provider was, selecting among three predefined categories: human coach, AI-based coach, or a hybrid combination. This variable enables comparison across different coaching modalities.

5. Athlete Type

Participants self-categorized as either recreational, semi-professional, or professional athletes. For analytic clarity and theoretical alignment, this variable was later dichotomized into *recreational* versus *semi-/professional* athletes. This decision reflects a conceptual boundary grounded in the literature on athlete typologies and their differing support needs. Research suggests that recreational athletes typically engage in sport for enjoyment, self-expression, and well-being, while semi-professional and professional athletes exhibit higher levels of discipline, performance orientation, and emotional control due to exposure to competitive demands (Mitić et al., 2021; Piepiora, 2024; Piermattéo et al., 2018). Thus, merging semi-professional and professional athletes into a single analytical category enables a more meaningful contrast with recreational participants, capturing the theoretically relevant distinction between competitive and non-competitive sport engagement in relation to emotional support expectations.

6. Support Match (Theoretical Construct)

Although not directly measured through a single item, the support match construct plays a central role in the conceptual model. It is defined as the alignment between expected and received emotional support. The operationalization and computation of this variable are described in Chapter 5.

7. Moderators and Interaction Constructs

The conceptual framework includes two hypothesized moderators:

- ‘Coach Type’, moderating the relationship between perceived emotional support and retention intention;
- ‘Athlete Type’, moderating the effect of support match on retention intention.

Interaction effects are statistically modeled in Chapter 5 using centered variables and product terms, following best practices for moderation testing.

Variable Construction

The following section outlines how key analytical variables were constructed from the raw survey data in SPSS. While the previous section explained the theoretical constructs and their respective measurement scales, this section describes the specific coding, transformations, and preparations undertaken to prepare the data for statistical analysis. All core constructs were measured using 7-point Likert scales.

- Retention Intention (*RetentionIntention*): Computed as the average of two items (Q5_1 and Q5_2), capturing the athlete’s intention to continue with their current coaching setup.
- Perceived Emotional Support (*EmoSupport_Received*): Calculated as the mean of five items (Q3_1 to Q3_5) assessing the emotional support perceived from the coaching provider.
- Expected Emotional Support (*EmoSupport_Expected*): Calculated as the mean of four items (Q4_1 to Q4_4), measuring the level of emotional support athletes expected from their coach or system.
- Support Match (*SupportMatch*): Defined as the absolute difference between *EmoSupport_Received* and *EmoSupport_Expected*, this variable captures the alignment between received and expected support.

To enable group comparisons and interaction analysis, the following dummy variables were created:

- Coach Type: Originally coded as a categorical variable with three levels (1 = Human, 2 = AI-based, 3 = Hybrid). Two dummy variables were created:
 - *D_AICoach*: 1 = AI-based, 0 = otherwise
 - *D_HybridCoach*: 1 = Hybrid, 0 = otherwise

Human coaching serves as the reference category.

- Athlete Type (*D_CompulsiveAthlete*): Recoded into a binary dummy variable with 1 = Semi-Professional/Professional and 0 = Recreational, based on self-reported competition level.

To reduce multicollinearity and support moderation analyses, centered variables and interaction terms were created:

- Centered Predictors:

$$EmoSupport_Centered = EmoSupport_Received - 5.1300$$

$$SupportMatch_Centered = SupportMatch - 0.9008$$

- Interaction Terms:

$$Int_EmoSupport_AI = EmoSupport_Centered \times D_AICoach$$

$$Int_EmoSupport_Hybrid = EmoSupport_Centered \times D_HybridCoach$$

$$Int_SupportMatch_AthleteType = SupportMatch_Centered \times D_CompetitiveAthlete$$

These variables were subsequently used to test the study's hypotheses via multiple linear regression models, moderation analyses, and mediation testing.

Control Variables

To account for individual differences that may influence athletes' perceptions of emotional support and their intention to remain in coaching programs, several control variables were included in the regression models. These controls aim to isolate the effects of the main predictors and ensure that observed relationships are not confounded by basic demographic or behavioral factors.

Age: Age was included as a continuous control variable, as research suggests that athletes at different life stages may differ in their psychological needs, expectations of coaching relationships, and coping strategies. For example, older athletes may place more value on autonomy and individualized attention, while younger athletes might benefit more from motivational and relational support structures.

Gender: Gender was coded as a binary variable (0 = Male, 1 = Female). Prior studies have shown that gender can influence the experience and perception of coaching behaviors, particularly in terms of emotional responsiveness, communication, and perceived empathy (Kerr & Stirling,

2012). Including gender as a control allows for the consideration of these potential perceptual differences.

Training Frequency: The number of weekly training sessions was included as a proxy for athlete engagement and exposure to the coaching system. Athletes who train more frequently may have more extensive interactions with their coaches or platforms, which could influence both the quantity and quality of emotional support received. This variable was captured through the survey item “On average, how many times per week do you train using this program?” and treated as a continuous measure.

Including these control variables enhances the robustness of the regression models by helping to partial out variance that is attributable to stable demographic or behavioral characteristics rather than the key constructs under investigation.

Model Specification

To evaluate the hypotheses derived from the literature review and the theoretical framework, four regression models were specified, each grouping related hypotheses to test core, interaction, and conditional effects.

Model 1 tests the foundational relationship between perceived emotional support and retention intention, representing Hypothesis 1. This model includes control variables (age, gender, training frequency) to account for individual differences.

H1:

$$RetentionIntention = \beta_0 + \beta_1 * EmoSupport_Received + \beta_2 * Age + \beta_3 * Gender + \beta_4 * TrainingFreq + \varepsilon$$

Model 2 examines how coaching format, human, AI-based, or hybrid, shapes athletes' perceptions of emotional support and influences their retention intention. It builds on Model 1 by introducing coach type as both an explanatory and moderating variable, thereby extending the analysis from a general effect of emotional support to format-specific dynamics. First it tests whether coach type significantly affects perceived emotional support (H2), and then whether it moderates the relationship between emotional support and retention intention (H3). The model combines a main effect analysis with a moderated regression to assess whether the emotional impact of coaching differs by format.

H2:

$$EmoSupport_Received = \beta_0 + \beta_1 * D_AI_Coach + \beta_2 * D_HybridCoach + \varepsilon$$

H3:

$$RetentionIntention = \beta_0 + \beta_1 * EmoSupport_Centered + \beta_2 * D_AI_Coach + \beta_3 * D_HybridCoach + \beta_4 * Int_EmoSupport_AI + \beta_5 * Int_EmoSupport_Hybrid + \beta_6 * Age + \beta_7 * Gender + \beta_8 * TrainingFreq + \varepsilon$$

Model 3 examines the role of emotional support alignment, termed support match, in shaping athlete retention. This model tests two hypotheses: whether the absolute difference between emotional support expected and received is negatively associated with retention intention (H4), and whether support match mediates the relationship between coach type and retention intention (H5). To test the latter, a three-step mediation procedure is employed following the Baron and Kenny (1986) approach, which involves assessing: (1) the direct effect of coach type on retention,

(2) the effect of coach type on support match, and (3) the combined effect of coach type and support match on retention intention. By introducing support match as an intervening variable, Model 3 extends the analysis of coach type effects and integrates a psychological mechanism that captures how emotional fit influences long-term coaching engagement.

H4:

$$RetentionIntention = \beta_0 + \beta_1 * SupportMatch + \beta_2 * Age + \beta_3 * Gender + \beta_4 * TrainingFreq + \varepsilon$$

H5:

$$(1) RetentionIntention = \beta_0 + \beta_1 * D_AICoach + \beta_2 * D_HybridCoach + \beta_3 * Age + \beta_4 * Gender + \beta_5 * TrainingFreq + \varepsilon$$

$$(2) SupportMatch = \beta_0 + \beta_1 * D_AICoach + \beta_2 * D_HybridCoach + \beta_3 * Age + \beta_4 * Gender + \beta_5 * TrainingFreq + \varepsilon$$

$$(3) RetentionIntention = \beta_0 + \beta_1 * D_AICoach + \beta_2 * D_HybridCoach + \beta_3 * SupportMatch + \beta_4 * Age + \beta_5 * Gender + \beta_6 * TrainingFreq + \varepsilon$$

Model 4 investigates how athlete typologies influence the relationship between support match and retention intention. Drawing on psychological and motivational distinctions between recreational and semi-/professional athletes, this model tests whether athlete type moderates the effect of support match on retention (H6). By introducing athlete type as a moderator, Model 4 builds on the Expectation–Disconfirmation Theory framework from Model 3 and explores whether the effectiveness of emotional support alignment is contingent on the athlete’s competitive level and emotional processing style.

H6:

$$RetentionIntention = \beta_0 + \beta_1 * D_CompetitiveAthlete + \beta_2 * SupportMatch_Centered + \beta_3 * Int_SupportMatch_AthleteType + \beta_4 * Age + \beta_5 * Gender + \beta_6 * TrainingFreq + \varepsilon$$

Results

Descriptive Statistics & Correlations

To provide an initial overview of the data, descriptive statistics were computed for all core continuous variables: ‘Perceived Emotional Support Received’, ‘Expected Emotional Support’, ‘Support Match’, and ‘Retention Intention’. As shown in Table 1, the mean values for both emotional support received ($M = 5.13$, $SD = 1.21$) and expected ($M = 5.28$, $SD = 1.17$) were relatively high on a 7-point scale, indicating that athletes generally both anticipated and perceived substantial emotional support from their coaching systems. The mean support match value ($M = 0.90$, $SD = 0.91$) suggests that most athletes experienced only a moderate discrepancy between what they expected and what they received in terms of emotional support. Retention intention also showed a relatively high average score ($M = 5.09$, $SD = 1.35$), implying generally strong commitment to the coaching relationship across the sample.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
EmoSupport_Received	120	1.00	7.00	5.1300	1.20633
EmoSupport_Expected	120	1.75	7.00	5.2750	1.16875
SupportMatch	120	.00	4.85	.9008	.90862
RetentionIntention	120	1.00	7.00	5.0917	1.34568
Valid N (listwise)	120				

Table 1: Descriptive Statistics

To explore associations between key variables, Pearson correlation coefficients were calculated (see Table 2). As hypothesized, perceived emotional support received was strongly and positively correlated with retention intention ($r = .783, p < .001$), offering preliminary support for H1. Expected emotional support also correlated positively with retention ($r = .484, p < .001$), although to a lesser extent. In line with H4, the support match variable, was significantly and negatively associated with retention intention ($r = -.264, p = .004$), indicating that greater mismatch is related to reduced likelihood of continuing the coaching relationship. Support match also showed moderate negative correlations with both received support ($r = -.367, p < .001$) and expected support ($r = -.252, p = .006$), validating its interpretation as a measure of emotional misalignment. Taken together, these descriptive and correlational findings provide early empirical backing for the proposed model, particularly with regard to the central role of emotional support and its alignment in shaping retention behavior among athletes.

		Correlations			
		EmoSupport_R eceived	EmoSupport_E xpected	RetentionInten tion	SupportMatch
EmoSupport_Received	Pearson Correlation	1	.425**	.783**	-.367**
	Sig. (2-tailed)		<.001	<.001	<.001
	N	120	120	120	120
EmoSupport_Expected	Pearson Correlation	.425**	1	.484**	-.252**
	Sig. (2-tailed)	<.001		<.001	.006
	N	120	120	120	120
RetentionIntention	Pearson Correlation	.783**	.484**	1	-.264**
	Sig. (2-tailed)	<.001	<.001		.004
	N	120	120	120	120
SupportMatch	Pearson Correlation	-.367**	-.252**	-.264**	1
	Sig. (2-tailed)	<.001	.006	.004	
	N	120	120	120	120

** . Correlation is significant at the 0.01 level (2-tailed).

Table 2: Correlations

Assumption testing

To ensure the validity of the regression-based hypothesis testing, key statistical assumptions were examined using the most complex model in the study, Model 2 (Hypothesis 3), which includes continuous predictors, dummy-coded categorical variables, and interaction terms. Consequently, core regression assumptions, namely linearity, normality of residuals, multicollinearity, homoscedasticity, and absence of influential outliers, can be primarily assessed through Hypothesis 3 and extended to Hypotheses 1, 4, and 6.

Homoscedasticity was examined through a scatterplot of standardized residuals versus predicted values (Figure 5). The plot revealed a random dispersion of residuals without systematic patterns, indicating constant variance across levels of the predictors.

Multicollinearity was assessed using Variance Inflation Factor (VIF) and tolerance statistics, with all VIF values ranging between 1.226 and 2.727, well below the conservative threshold of 5, and all tolerance values exceeding 0.2 as seen in Table 3. These results confirm that multicollinearity and heteroskedasticity do not pose a concern, supporting the integrity of regression estimates across all models.

Linearity was assessed through a scatterplot of the centered emotional support variable against the dependent variable, retention intention. The visual inspection revealed an upward-trending, oval-shaped distribution of data points, consistent with a linear relationship (Figure 2).

Normality of residuals was evaluated using both a histogram and a normal probability (P–P) plot of standardized residuals. The histogram showed a reasonably symmetric bell-shaped distribution (Figure 3), while the P–P plot revealed that the residuals closely followed the expected diagonal line (Figure 4). These results support the assumption of normally distributed residuals.

Influential outliers were examined via Cook's Distance. The maximum Cook's Distance value observed was 0.165, well below the conservative threshold of 1.0, indicating that no individual case exerted disproportionate influence on the model (Table 3).

However, Hypothesis 2 employs a one-way ANOVA design, which relies on distinct assumptions (independence of observations, homogeneity of variances across groups and normality of residuals within groups). Therefore, this model is not covered by the regression-based diagnostics and will be assessed separately using ANOVA-specific tests.

Independence was ensured through the survey design, which instructed participants to select only one coaching format (human, AI-based, or hybrid), thereby guaranteeing that each response represented a unique individual with no overlapping group membership.

To assess normality, the Shapiro–Wilk test and histogram inspection were conducted separately for each group. While the Shapiro–Wilk test indicated a statistically significant deviation from normality in the human coach group ($p = .004$), the other two groups, AI-based ($p = .395$) and hybrid ($p = .857$), showed no significant departures (Table 4). Despite the formal violation in the human group, visual inspection revealed a reasonably symmetric distribution, and the skewness (-0.803) and kurtosis (-0.173) statistics remained within acceptable bounds. Given that this group exceeds the common threshold of 30 cases ($N = 55$), the deviation is not considered severe. As ANOVA is robust to moderate violations of normality, particularly in larger and balanced samples, the assumption of normality is deemed sufficiently met across all groups.

To test the assumption of homogeneity of variances across coaching groups, Levene's Test was conducted using the dependent variable *EmoSupport_Received*. The result was not statistically significant, $F(2, 117) = 1.273$, $p = .284$ as seen in table 5, indicating that the variances across the human, AI-based, and hybrid coaching groups can be considered equal. As the p-value exceeds the conventional alpha threshold of .05, the assumption of homogeneity of variances is satisfied. Therefore, the use of standard one-way ANOVA remains appropriate for testing Hypothesis 2.

Finally, Hypothesis 5 involves a three-step mediation analysis following the Baron and Kenny framework, where Step 2 uses SupportMatch as a dependent variable. Since this outcome variable differs from the main dependent variable (RetentionIntention) used in the other models, an additional residual analysis, including checks for normality, linearity, and outliers, will be conducted specifically for Step 2 of the mediation test to ensure the validity of its inferences.

The scatterplot of standardized predicted values against standardized residuals (Figure 9) revealed a random, oval-shaped distribution without funnel or curvature patterns, indicating that the assumption of linearity was met. A histogram of the standardized residuals (Figure 11) showed a bell-shaped distribution with minor skewness, and the P–P plot (Figure 10) demonstrated that residuals closely followed the expected normal distribution line, supporting the assumption of normally distributed errors. Additionally, checks for outliers and influential data points revealed no violations: standardized residuals remained within acceptable bounds (−1.62 to +3.99), Cook’s Distance values in Table 6 were well below the critical threshold (max = 0.205). Taken together, these results confirm that the residuals met the assumptions of linearity, normality, and independence from outliers, validating the regression model used in Step 2 of the mediation test.

Reliability & Robustness check

To evaluate the stability and reliability of the regression findings, two robustness checks were performed. First, to mitigate potential multicollinearity, especially relevant in models involving interaction terms, mean-centering was applied to key predictors in the moderation analyses (H3 and H6). This step was crucial for the interaction terms between support match and athlete type, as well as between emotional support and coach type. The centered models yielded results that closely mirrored those of the uncentered versions in both the direction and significance of effects. This consistency underscores the robustness of the findings and confirms that multicollinearity did not compromise the interpretability of the interaction effects.

Second, the internal consistency of the primary constructs used in the regression analyses was assessed using Cronbach’s alpha. The scale measuring perceived emotional support received demonstrated excellent reliability ($\alpha = .863$, 5 items), while the expected emotional support scale exhibited good internal consistency ($\alpha = .791$, 4 items). The retention intention scale also met acceptable reliability standards ($\alpha = .749$, 2 items). Together, these reliability metrics reinforce the validity of the study’s core results.

<p>Reliability</p> <p>Scale: Perceived Emotional Support Received</p> <p>Case Processing Summary</p> <table border="1"> <thead> <tr> <th colspan="2"></th> <th>N</th> <th>%</th> </tr> </thead> <tbody> <tr> <td>Cases</td> <td>Valid</td> <td>120</td> <td>100.0</td> </tr> <tr> <td></td> <td>Excluded^a</td> <td>0</td> <td>.0</td> </tr> <tr> <td colspan="2">Total</td> <td>120</td> <td>100.0</td> </tr> </tbody> </table> <p>a. Listwise deletion based on all variables in the procedure.</p> <p>Reliability Statistics</p> <table border="1"> <thead> <tr> <th>Cronbach's Alpha</th> <th>N of Items</th> </tr> </thead> <tbody> <tr> <td>.863</td> <td>5</td> </tr> </tbody> </table>			N	%	Cases	Valid	120	100.0		Excluded ^a	0	.0	Total		120	100.0	Cronbach's Alpha	N of Items	.863	5	<p>Reliability</p> <p>Scale: Retention Intention</p> <p>Case Processing Summary</p> <table border="1"> <thead> <tr> <th colspan="2"></th> <th>N</th> <th>%</th> </tr> </thead> <tbody> <tr> <td>Cases</td> <td>Valid</td> <td>120</td> <td>100.0</td> </tr> <tr> <td></td> <td>Excluded^a</td> <td>0</td> <td>.0</td> </tr> <tr> <td colspan="2">Total</td> <td>120</td> <td>100.0</td> </tr> </tbody> </table> <p>a. Listwise deletion based on all variables in the procedure.</p> <p>Reliability Statistics</p> <table border="1"> <thead> <tr> <th>Cronbach's Alpha</th> <th>N of Items</th> </tr> </thead> <tbody> <tr> <td>.749</td> <td>2</td> </tr> </tbody> </table>			N	%	Cases	Valid	120	100.0		Excluded ^a	0	.0	Total		120	100.0	Cronbach's Alpha	N of Items	.749	2
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Table 7: Reliability & Robustness check

Hypothesis Testing

H1: Emotional Support as a Predictor of Retention

To test Hypothesis 1 (H1), which proposes that perceived emotional support is positively associated with retention intention, a multiple linear regression analysis was conducted. In this model, *EmoSupport_Received* was entered as the main predictor variable, while *Age_numeric*, *Gender_Dummy*, and *Training Frequency* were included as control variables to account for potential confounding effects.

The overall model was statistically significant, $F = 47.86$, $p < .001$, and explained 65.2% of the variance in retention intention ($R^2 = .652$, Adjusted $R^2 = .639$). This indicates that the inclusion of control variables slightly improved the model's explanatory power compared to the baseline model without controls ($R^2 = .612$), suggesting added robustness.

Critically, the predictor *EmoSupport_Received* remained a strong and significant contributor to retention intention, $B = 0.899$, $SE = 0.066$, $t = 13.63$, $p < .001$. The standardized beta coefficient ($\beta = .811$) reflects a large effect size, confirming that higher levels of perceived emotional support are strongly associated with greater intentions to remain in the current coaching relationship, even when controlling for age, gender, and training frequency.

In conclusion, these results provide strong support for Hypothesis 1: perceived emotional support significantly and positively influences retention intention.

H2: Coach Type and Perceived Emotional Support

To assess whether coach type significantly influences perceived emotional support, a one-way ANOVA was conducted with 'EmoSupport_Received' as the dependent variable and 'CoachType' as the independent variable.

The analysis revealed a statistically significant effect of coach type on perceived emotional support, $F = 9.87$, $p < .001$. The effect size, measured by eta squared, was $\eta^2 = .144$, indicating a moderate to large effect. Descriptive statistics showed that athletes coached by human coaches reported the highest levels of emotional support ($M = 5.58$, $SD = 1.08$), followed by those in hybrid coaching formats ($M = 5.07$, $SD = 0.90$), while AI-based coaches received the lowest support ratings ($M = 4.53$, $SD = 1.31$).

To explore which group differences accounted for the overall effect, Tukey HSD post hoc tests were conducted. These revealed a significant difference between the human and AI coaching groups (mean difference = 1.05, $p < .001$), but no significant differences between the hybrid group and either of the other two conditions. Thus, the hybrid coaching format appears to be perceived as a middle-ground solution, not statistically distinct from either extreme.

The homogeneous subsets analysis supported this interpretation: AI-based coaches clustered in the lowest subset of support, human coaches in the highest, and hybrid formats fell into both categories, further confirming their intermediary perception.

Taken together, these findings support Hypothesis 2, demonstrating that the type of coach significantly affects how emotionally supportive the coaching experience is perceived to be. In particular, human coaches provide statistically significant higher levels of perceived emotional support than AI-based systems.

H3: Coach type as a moderator between Perceived Emotional Support and RetentionIntention.

To test Hypothesis 3 (H3), which proposed that coach type moderates the relationship between perceived emotional support and retention intention, a multiple linear regression was conducted. The overall model was significant, $F = 24.44$, $p < .001$, with an Adjusted R^2 of .639, indicating that approximately 64% of the variance in retention intention could be explained by the combined predictors. As expected, the main effect of centered emotional support was highly significant ($B = .899$, $SE = .110$, $p < .001$), confirming that higher levels of perceived emotional support are strongly associated with greater retention intention. However, neither interaction term reached statistical significance:

- Int_EmoSupport_AI: $B = .002$, $SE = .150$, $p = .987$
- Int_EmoSupport_Hybrid: $B = -.242$, $SE = .225$, $p = .285$

These findings indicate that the strength of the relationship between emotional support and retention intention does not vary significantly by coaching format. Thus, while coach type influences how emotionally supportive a coach is perceived to be (as established in H2), it does not moderate the effect of emotional support on retention.

Additionally, direct effects of coach type were non-significant. Neither the AI vs. human ($B = -.160$, $p = .430$) nor the hybrid vs. human comparison ($B = -.350$, $p = .096$) significantly predicted retention intention in this model.

In conclusion, although perceived emotional support is a key driver of retention, its influence is consistent across human, AI, and hybrid coaching types. Therefore, Hypothesis 3 is not supported.

H4: Support Match and Retention Intention

To test Hypothesis 4 (H4), which proposes that support match negatively predicts retention intention, a multiple linear regression was conducted. The predictor variable was the absolute difference between expected and received emotional support (SupportMatch), and the dependent variable was RetentionIntention. Age, gender, and training frequency were included as control variables to account for their potential influence on the outcome.

The model was statistically significant, $F = 2.687$, $p = .035$, and explained approximately 9.5% of the variance in retention intention ($R^2 = .095$, Adjusted $R^2 = .060$). Although modest in explained variance, the model provides meaningful insights, particularly in the context of psychological predictors in sport settings.

The regression coefficient for SupportMatch was statistically significant, $B = -0.411$, $SE = 0.141$, $t(102) = -2.924$, $p = .004$, with a standardized beta of $\beta = -.284$. This indicates that a greater mismatch between expected and received emotional support is associated with a lower intention to stay in the current coaching relationship. Importantly, the effect remains significant even when accounting for demographic and behavioral factors, suggesting that the alignment between athletes' support expectations and experiences plays an independent role in shaping retention.

In conclusion, support mismatch significantly and negatively influences athletes' intention to remain with their coach or system, supporting Hypothesis 4.

H5: 'SupportMatch' as a Mediator between Coach Type and Retention Intention

Hypothesis 5 proposed that support match mediates the relationship between coaching type and retention intention. A three-step mediation analysis following the Baron and Kenny approach was conducted using two dummy-coded variables representing coaching type (AI vs. Human; Hybrid vs. Human), with “Human” coaching serving as the reference category.

In Step 1, a multiple regression tested whether coach type predicted retention intention. Both dummy variables were significant: participants in the AI-based coaching condition reported significantly lower retention intention compared to those coached by humans ($B = -1.078, p < .001$), as did those in hybrid coaching ($B = -0.876, p = .006$). This confirmed that coaching type has a direct effect on retention intention, satisfying the first condition for mediation.

In Step 2, coach type was tested as a predictor of the proposed mediator, support match. Here, only the AI vs. Human dummy reached statistical significance ($B = 0.799, p < .001$), indicating that AI-based coaching is associated with a larger discrepancy between expected and received emotional support. The hybrid vs. human contrast was not significant ($p = .166$).

In Step 3, both coach type and support match were entered into a regression predicting retention intention. The direct effects of AI coaching ($B = -0.868, p = .006$) and hybrid coaching ($B = -0.798, p = .012$) remained statistically significant, though slightly reduced compared to Step 1. However, support match did not reach conventional significance ($B = -0.263, p = .074$).

Control variables (age, gender, and training frequency) were included in all models. In Step 2, gender significantly predicted support match ($B = -0.361, p = .040$), indicating that male athletes reported a closer alignment between expected and received emotional support than female athletes. However, none of the control variables were significant predictors of retention intention in Steps 1 or 3, indicating that their influence does not extend to the outcome variable.

In sum, while the reduction in the coach type coefficients hints at a potential mediating pathway, the lack of a significant effect for support match in the final model means that statistical mediation cannot be confirmed.

H6: Athlete type as a moderator between 'SupportMatch' and Retention Intention

To test Hypothesis 6 (H6), which proposes that athlete type moderates the relationship between support match and retention intention, a multiple linear regression analysis was conducted. Control variables were also included in the model to account for individual differences.

The overall model was statistically significant, $F = 2.798$, $p = .015$, and explained approximately 14.4% of the variance in retention intention ($R^2 = .144$, Adjusted $R^2 = .092$).

Among the predictors, the centered support match variable did not reach statistical significance ($B = -0.276$, $p = .074$), although the direction of the effect suggests that greater misalignment between expected and received emotional support may reduce athletes' willingness to continue with the coaching relationship.

The critical interaction term between support match and athlete type was also not statistically significant ($B = -0.560$, $p = .106$), suggesting that athlete type (recreational vs. semi-/professional) does not significantly moderate the effect of support match on retention intention.

Control variables (age, gender, and training hours) did not have significant effects and did not meaningfully alter the interpretation of the key interaction.

Taken together, these results do not support Hypothesis 6. While support misalignment may reduce retention intention overall, this effect does not significantly depend on the competitive level of the athlete. Therefore, one cannot conclude that athlete type moderates the relationship between support match and retention intention.

Summary of key findings

Model	Description	Supported?
Model 1	<i>H1: Perceived emotional support received is positively associated with retention intention.</i>	Supported
Model 2	<i>H2: The type of coach (human, AI, hybrid) has a significant effect on perceived emotional support.</i>	Supported
Model 2	<i>H3: Coach type moderates the relationship between perceived emotional support and retention intention.</i>	Not Supported
Model 3	<i>H4: The absolute difference between emotional support received and expected is negatively associated with retention intention.</i>	Supported
Model 3	<i>H5: Support match mediates the relationship between coaching type and retention intention.</i>	Not Supported
Model 4	<i>H6: Athlete type (recreational, semi-professional, professional) moderates the relationship between support match and retention intention.</i>	Not Supported

Table 21: Summary of Results

The results provide mixed but insightful support for the proposed hypotheses. Hypothesis 1, which posited that perceived emotional support would positively predict retention intention, was strongly supported with a large effect size, underscoring the critical role of emotional support in sustaining coaching relationships. Hypothesis 2 was also confirmed, showing that coach type significantly influences perceived emotional support, with human coaches rated highest and AI-based systems lowest. However, Hypothesis 3, which tested whether coach type moderates the effect of perceived emotional support on retention, was not supported; the strength of this relationship remained consistent across coaching types. Hypothesis 4 received support, demonstrating that support mismatch negatively predicts retention intention, even when accounting for control variables. In contrast, Hypothesis 5, which tested whether support match mediates the relationship between coach type and retention intention using the Baron and Kenny approach, was not supported, as the mediator did not reach significance in the final step. Lastly, Hypothesis 6, which examined whether athlete type moderates the relationship between support match and retention intention, also failed

to find a significant interaction, suggesting that the impact of support alignment on retention does not vary by athlete level.

Discussion

This study set out to answer the research question: How does the type of coaching (human, AI-based, or hybrid) shape athletes' perceptions of emotional support, and how do these perceptions, alongside individual support needs, affect client retention? The findings reveal that emotional support is a robust predictor of retention, expectation mismatch reduces retention, and these relationships hold across both coach types and athlete levels.

Theoretical Contributions

This study advances theory at the intersection of emotional support, technology-mediated coaching, and athlete retention, offering several contributions to the fields of sports psychology, human-AI interaction, and client relationship theory in digital health and performance contexts.

Extending Expectancy Disconfirmation Theory to AI-Supported Coaching

This thesis contributes to Expectancy Disconfirmation Theory (EDT) by applying it in a novel context: AI and hybrid sport coaching environments. The observed negative association between support mismatch and retention intention demonstrates that emotional expectation misalignment has adverse effects even when the coach is not human. By showing that the disconfirmation of emotional needs drives disengagement across all coach types, this study refines EDT for use in affective domains of digital coaching.

Validating Emotional Support as a Universal Retention Mechanism

Building on prior work (e.g., Coussens et al., 2025; Martinelli et al., 2016), this research confirms the foundational role of emotional support in sustaining coaching relationships. Importantly, the predictive power of perceived emotional support on retention intention held regardless of whether coaching was human, AI-based, or hybrid. This contributes to the growing literature that treats emotional connection as a trans-contextual driver of client engagement, independent of delivery format, and reinforces emotional support as a central construct in sport coaching theory.

Decoupling Coach Format from Emotional Function

While ANOVA results show that human coaches are perceived as more emotionally supportive than AI systems, the moderation analysis reveals that coach type does not alter the effect of emotional support on retention. This suggests that the underlying emotional mechanism operates

similarly across formats, even though perceived support levels differ. The study thus challenges assumptions in coaching psychology that human delivery has superior emotional impact, showing instead that format does not moderate emotional efficacy, but its perception does.

Challenging Athlete Typology Assumptions

Contrary to expectations based on athlete segmentation theory, the results indicate no significant moderation by athlete type on the support match–retention relationship. This suggests that sensitivity to emotional misalignment is not confined to elite athletes but spans all typologies. Theoretically, this highlights the need to move beyond demographic segmentation toward a universal personalization model of support needs, where affective calibration is prioritized across all user categories.

Taken together, these findings integrate perceived emotional support, expectation alignment, delivery modality, and athlete characteristics into a unified empirical model. This integration provides a theoretical reconceptualization of how emotional mechanisms operate in digital coaching, illustrating that retention in AI-supported sports programs hinges on emotional congruence rather than coach identity.

Practical implications

Based on the empirical findings, the following practical implications can guide coaching providers, digital platform developers, and training organizations navigating the shift toward AI-augmented formats in endurance sports. The results point toward one core insight: coaching effectiveness is not defined by delivery format, but by emotional resonance. Retention hinges less on whether the coach is human or artificial, and more on whether the athlete feels heard, supported, and emotionally aligned.

Designing Empathic AI: Preserving Emotional Support in Digital Coaching

The robust predictive power of perceived emotional support on athlete retention, regardless of whether coaching is human, AI, or hybrid, suggests that preserving emotional quality must remain a central design criterion in emerging coaching technologies. Developers and digital coaching platforms should prioritize interactional features that convey empathy, responsiveness, and individualized care. While AI systems currently score significantly lower than human coaches in perceived emotional support, this does not appear to reflect an inherent limitation of the medium, but rather an implementation gap. Investments in more affective interface design, adaptive communication algorithms, or hybrid approaches that embed human emotional cues into AI-generated content could significantly improve athletes' emotional connection to digital coaching.

Managing Support Expectations: Aligning Perceptions and Reality

The concept of support match emerges as a critical predictor of athlete retention. Coaching platforms and human practitioners alike should therefore consider assessing and managing emotional expectations at the outset of a training relationship. Digital onboarding processes that elicit athlete preferences, coupled with adaptive feedback systems, could help identify and correct emotional support mismatches early. In the case of AI systems, transparency regarding the emotional capabilities and limitations of the coach (e.g., through interface messaging or onboarding content) may help calibrate athlete expectations, reducing the likelihood of disengagement caused by unmet emotional needs.

Rethinking the Role of Coaching Modality

Although coach type influences perceived emotional support and has a direct effect on retention, the way emotional support influences retention remains stable across formats. This suggests that emotional support functions as a mechanism of engagement that is stable across formats, even if its delivery varies in quality. Thus, organizations should not necessarily avoid AI or hybrid formats but must ensure that these systems are perceived as emotionally supportive. This has two implications: first, hybrid systems should be strategically designed to amplify the emotional strengths of human involvement; and second, AI developers should avoid assuming that functional competence alone will retain users.

Universal Relevance Across Athlete Profiles

While initial hypotheses suggested that semi-/professional athletes might respond differently to emotional misalignment than recreational athletes, the data did not support this distinction. This implies that emotional support expectations are not confined to elite segments, but rather hold importance across all athlete typologies. Coaches and digital platforms should therefore not reserve emotional tailoring solely for high performers but recognize emotional support as a universally relevant driver of retention across athlete types. Efforts to personalize coaching, digitally or manually, should be extended broadly.

In sum, the practical insights from this study converge on a single actionable theme: coaching effectiveness in endurance sports is not format-dependent but emotionally dependent. Retention hinges less on whether the coach is human or artificial, and more on whether the athlete feels heard, supported, and aligned in their expectations. As the coaching industry continues to evolve, this emotional dimension must remain central to both technological innovation and human practice.

Limitations and Future Research

While this study offers novel insights into emotional support mechanisms across human, AI, and hybrid coaching models, several limitations warrant consideration and open avenues for future research.

First, the study employed a cross-sectional survey design, which restricts causal inference. Although regression analyses identified significant associations between emotional support variables and retention intention, temporal precedence cannot be established. Future studies employing longitudinal or experimental designs could better capture the dynamic evolution of support perceptions and their causal effects on athlete retention.

Second, coach type was not randomly assigned. Participants self-selected into human, AI, or hybrid coaching environments, introducing potential selection bias. Athletes who choose AI-based systems may differ systematically in openness to technology, prior expectations, or psychological needs. Randomized assignment or matched samples in future research could mitigate these biases and offer more robust causal insights.

Third, the distribution across coach types was uneven, with notably fewer participants coached solely by AI. This reduced statistical power in detecting group differences and potentially limited the representativeness of findings related to AI-only formats. A more balanced sampling frame or oversampling of underrepresented groups could address this limitation in future work.

Fourth, all variables were assessed through self-report measures, raising the possibility of common method bias and subjective interpretation. Although widely used in psychological research, self-reports of emotional support and expectations may be influenced by social desirability, mood states, or recall distortions. Combining survey data with behavioral usage metrics or third-party assessments could strengthen measurement validity.

Fifth, the study operationalized support match using the absolute difference between expected and received emotional support. While this method captures the magnitude of misalignment, it does

not reflect directionality (i.e., whether expectations were exceeded or undercut), nor does it distinguish between qualitative types of mismatch. Future research may benefit from exploring more nuanced operationalizations or incorporating qualitative insights into support disconfirmation.

Sixth, although training frequency was included as a control variable, the study did not capture other contextual variables such as duration of the coaching relationship or mode of interaction (e.g., in-person vs. remote). These factors could meaningfully shape how emotional support is delivered and perceived. Future work might integrate these dimensions to better model the ecology of support experiences.

Seventh, while the survey did not target a specific athletic domain, the final sample was skewed toward endurance athletes. This overrepresentation may influence how emotional support is valued or expressed, given the solitary and long-duration nature of endurance training. Replicating the study across more diverse sports contexts, such as team sports, strength-based disciplines, or combat sports, could enhance external validity and explore whether sport-specific cultures moderate support dynamics.

Taken together, these limitations provide opportunities for refinement and expansion. As AI coaching systems continue to evolve, future research should not only address methodological gaps but also interrogate emerging phenomena such as the role of avatar realism, adaptive empathy algorithms, and hybrid human-AI team structures. Understanding the affective contours of these new coaching paradigms will be critical in shaping both technological design and athlete-centered practice.

Conclusion

This thesis investigated how the type of coaching, human, AI-based, or hybrid, influences athletes' perceptions of emotional support, and how these perceptions, in conjunction with individual support needs, shape client retention. Drawing on Expectancy Disconfirmation Theory, the study examined both the level of emotional support perceived and the alignment between expected and received support across different coaching formats. The results reveal that coaching type significantly affects the perception of emotional support: human coaches are rated highest, followed by hybrid and AI-based coaches. However, this difference in perceived support does not moderate the relationship between emotional support and retention intention. Emotional support remains a powerful predictor of retention across all coaching types, indicating that the effectiveness of coaching is not format-dependent, but emotionally dependent. Furthermore, misalignment between expected and received support, regardless of direction—negatively impacts retention, confirming the importance of managing support expectations. Interestingly, athlete typology (recreational vs. semi-/professional) does not significantly alter these dynamics, suggesting that emotional support needs are broadly shared across performance levels.

Theoretically, this study contributes to the literature by extending Expectancy Disconfirmation Theory to the context of AI-supported coaching and by validating emotional support as a universal psychological mechanism of retention. It also challenges assumptions regarding the inherent superiority of human coaches in affective domains by demonstrating that coaching modality does not alter the impact of emotional support on retention.

Practically, the findings underscore the need for coaching systems, whether digital, human, or blended, to embed empathy, responsiveness, and expectation calibration into their design and delivery. Stakeholders designing the future of coaching, particularly technology developers, platform managers, and sport organizations, should prioritize emotional resonance alongside technical efficiency to ensure long-term athlete engagement and satisfaction.

Looking ahead, future research could build on these insights by exploring how specific emotional communication features in AI systems (e.g., tone adaptation, feedback responsiveness) shape

support perceptions over time, and by testing the durability of these effects in longitudinal or experimental settings. As the boundaries between human and machine coaching continue to blur, this study suggests that the key to sustainable athlete retention lies not in technological novelty but in emotionally intelligent design.

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Appendices

Data Analysis & Results

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
EmoSupport_Received	120	1.00	7.00	5.1300	1.20633
EmoSupport_Expected	120	1.75	7.00	5.2750	1.16875
SupportMatch	120	.00	4.85	.9008	.90862
RetentionIntention	120	1.00	7.00	5.0917	1.34568
Valid N (listwise)	120				

Table 1: Descriptive Statistics

Correlations

		EmoSupport_Received	EmoSupport_Expected	RetentionIntention	SupportMatch
EmoSupport_Received	Pearson Correlation	1	.425**	.783**	-.367**
	Sig. (2-tailed)		<.001	<.001	<.001
	N	120	120	120	120
EmoSupport_Expected	Pearson Correlation	.425**	1	.484**	-.252**
	Sig. (2-tailed)	<.001		<.001	.006
	N	120	120	120	120
RetentionIntention	Pearson Correlation	.783**	.484**	1	-.264**
	Sig. (2-tailed)	<.001	<.001		.004
	N	120	120	120	120
SupportMatch	Pearson Correlation	-.367**	-.252**	-.264**	1
	Sig. (2-tailed)	<.001	.006	.004	
	N	120	120	120	120

** . Correlation is significant at the 0.01 level (2-tailed).

Table 2: Correlations

Assumption testing

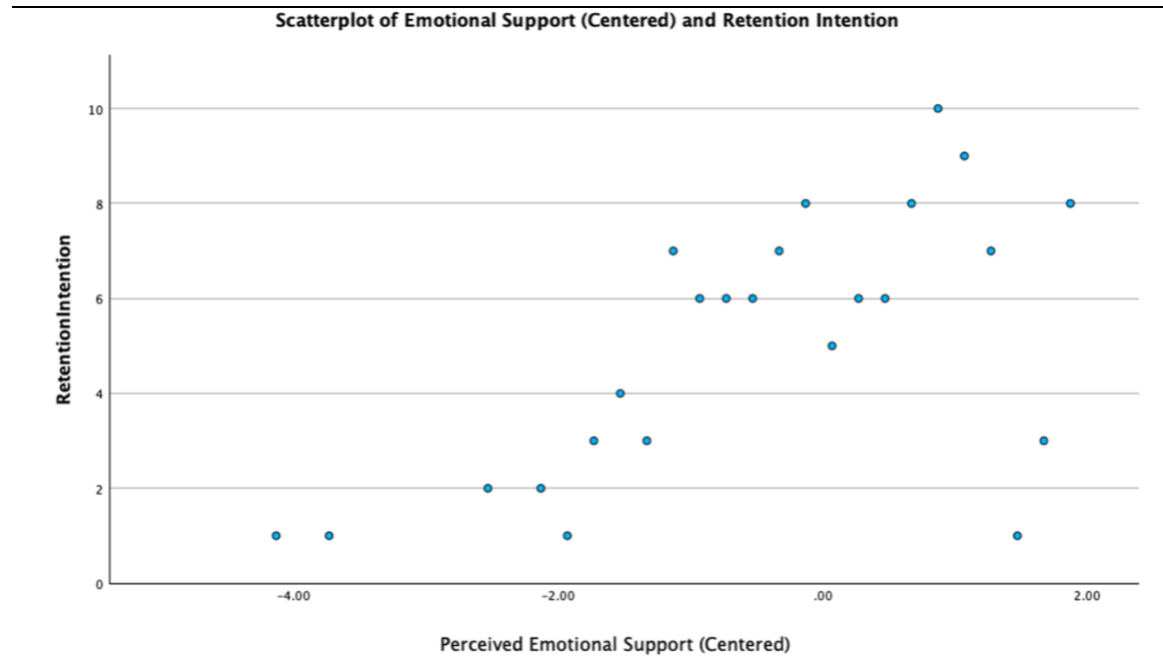


Figure 2: Linearity assumption

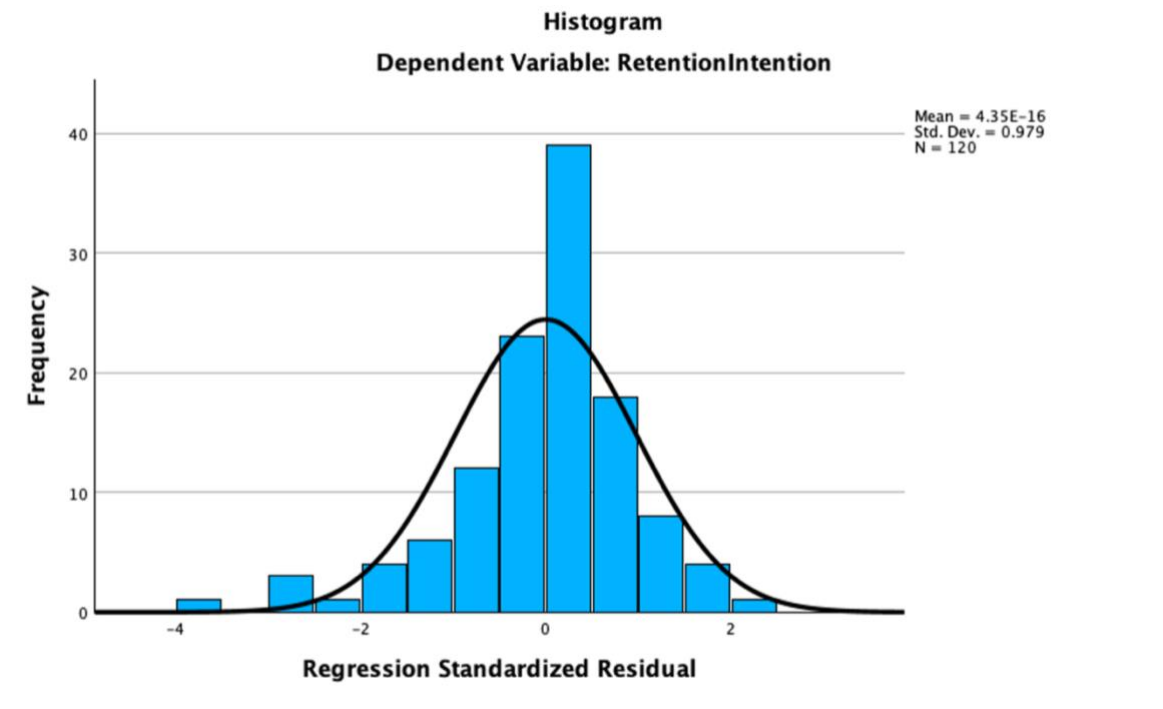


Figure 3: Normality of residuals assumption

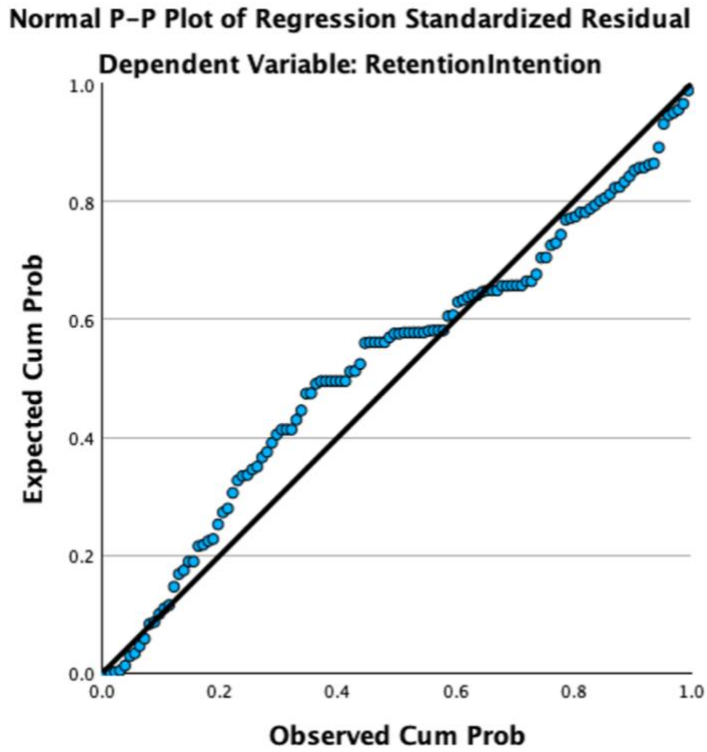


Figure 4: Normality of residuals assumption

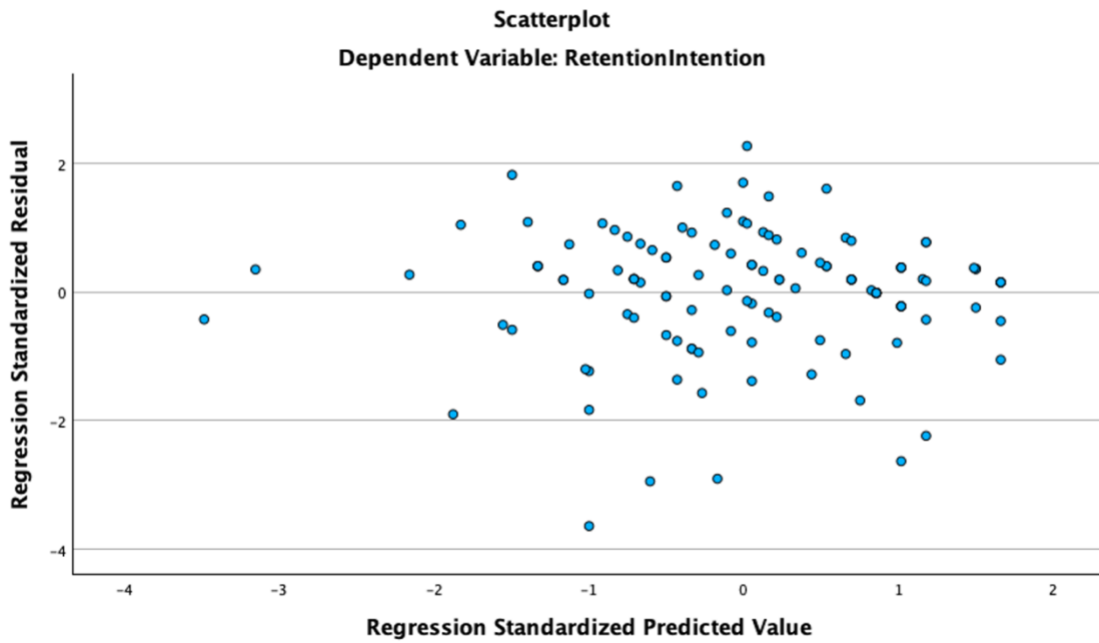


Figure 5: Homoscedasticity Assumption

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	5.259	.121		43.393	<.001		
	EmoSupport_Centered	.863	.104	.773	8.287	<.001	.367	2.727
	Dummy: AI vs Human	-.235	.192	-.082	-1.227	.222	.721	1.386
	Dummy: Hybrid vs Human	-.409	.201	-.127	-2.035	.044	.816	1.226
	Int_EmoSupport_AI	.027	.147	.016	.181	.856	.435	2.301
	Int_EmoSupport_Hybrid	-.303	.209	-.095	-1.449	.150	.749	1.335

a. Dependent Variable: RetentionIntention

Collinearity Diagnostics^a

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions						
				(Constant)	EmoSupport_C entered	Dummy: AI vs Human	Dummy: Hybrid vs Human	Int_EmoSupport_AI	Int_EmoSupport_Hybrid	
1	1	2.186	1.000	.03	.04	.06	.01	.05	.01	
	2	1.453	1.227	.09	.06	.01	.12	.02	.03	
	3	1.127	1.393	.00	.01	.05	.13	.02	.38	
	4	.767	1.689	.02	.03	.15	.23	.07	.25	
	5	.301	2.695	.26	.16	.45	.20	.36	.09	
	6	.166	3.626	.60	.70	.29	.31	.48	.24	

a. Dependent Variable: RetentionIntention

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.3507	6.8720	5.0917	1.07317	120
Std. Predicted Value	-3.486	1.659	.000	1.000	120
Standard Error of Predicted Value	.112	.390	.176	.059	120
Adjusted Predicted Value	1.4505	6.9179	5.0962	1.07390	120
Residual	-3.01877	1.88663	.00000	.81189	120
Std. Residual	-3.639	2.274	.000	.979	120
Stud. Residual	-3.696	2.334	-.003	1.005	120
Deleted Residual	-3.11426	1.98719	-.00450	.85774	120
Stud. Deleted Residual	-3.923	2.382	-.007	1.024	120
Mahal. Distance	1.173	25.365	4.958	4.576	120
Cook's Distance	.000	.165	.010	.023	120
Centered Leverage Value	.010	.213	.042	.038	120

a. Dependent Variable: RetentionIntention

Table 3: Influential Outliers & Multicollinearity assumption

Tests of Normality

Who is your primary coaching provider? (Who plans your training, guides your sessions, or structures your workouts?)		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
EmoSupport_Received	A human coach (e.g., personal trainer, club coach)	.145	55	.006	.932	55	.004
	An AI-based coaching system or app (e.g., Strava, ZING, TriDot, MacroFactor, etc)	.090	38	.200*	.970	38	.395
	A combination of both	.106	27	.200*	.980	27	.857

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 4: ANOVA normality of residuals within groups

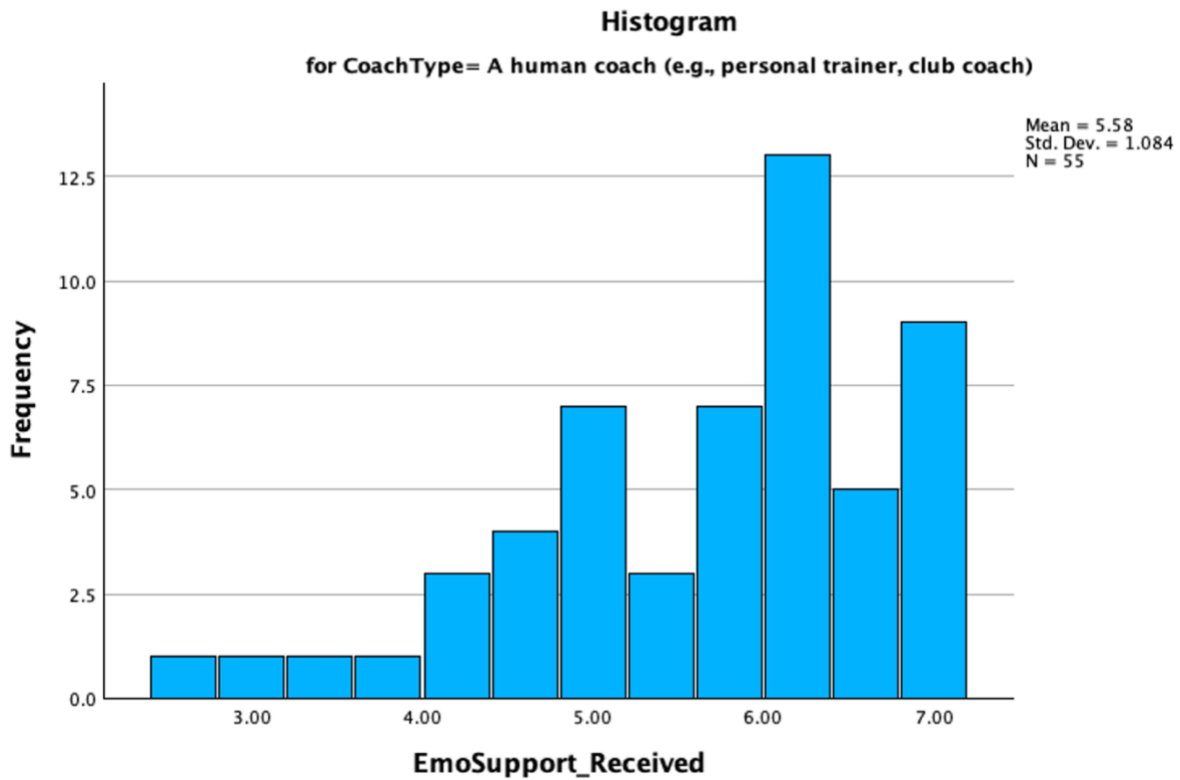


Figure 6: ANOVA normality of residuals within groups

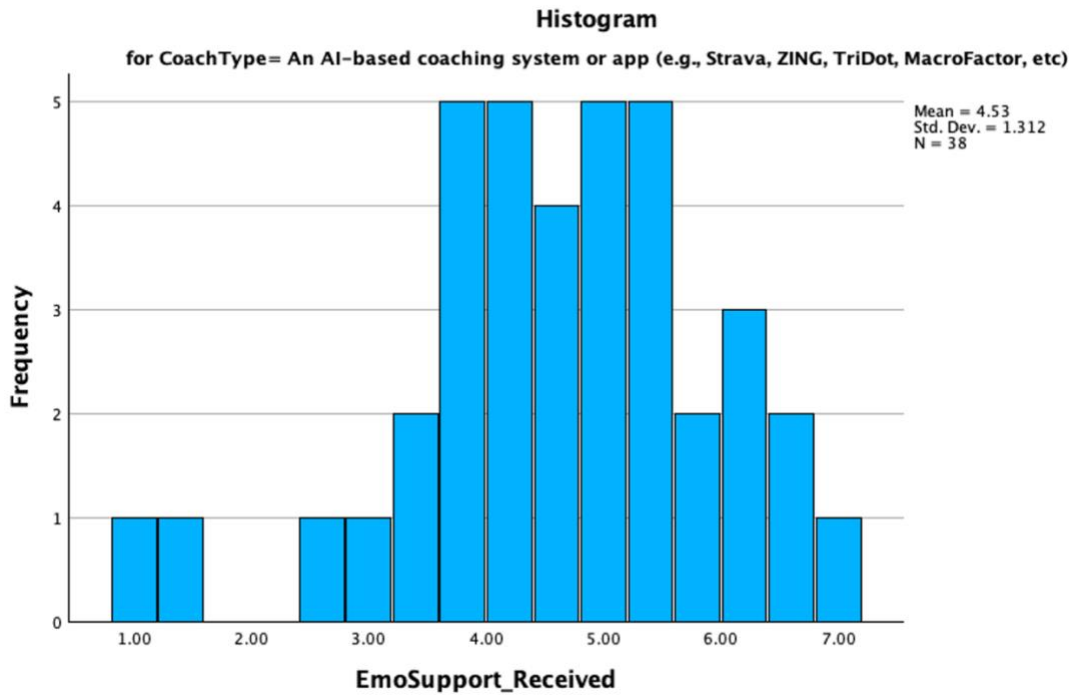


Figure 7: ANOVA normality of residuals within groups

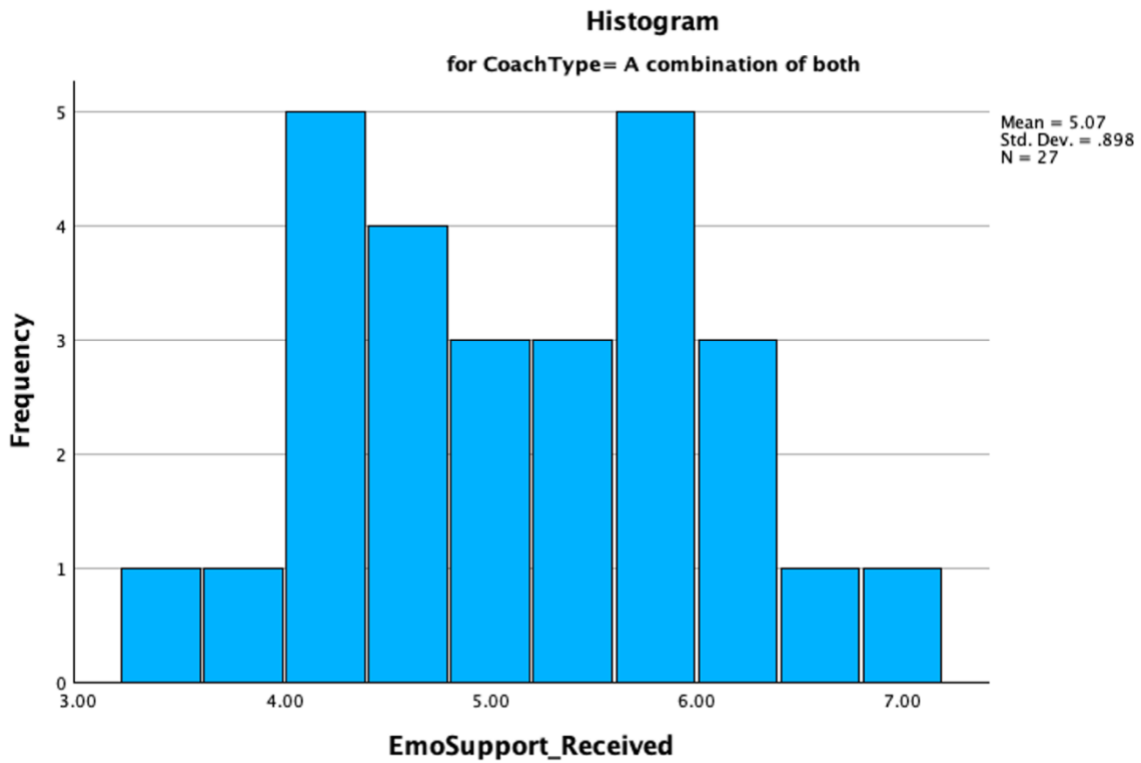


Figure 8: ANOVA normality of residuals within groups

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
EmoSupport_Received	Based on Mean	1.273	2	117	.284
	Based on Median	1.189	2	117	.308
	Based on Median and with adjusted df	1.189	2	105.600	.309
	Based on trimmed mean	1.226	2	117	.297

Table 5: H2 ANOVA assumption of homogeneity of variances

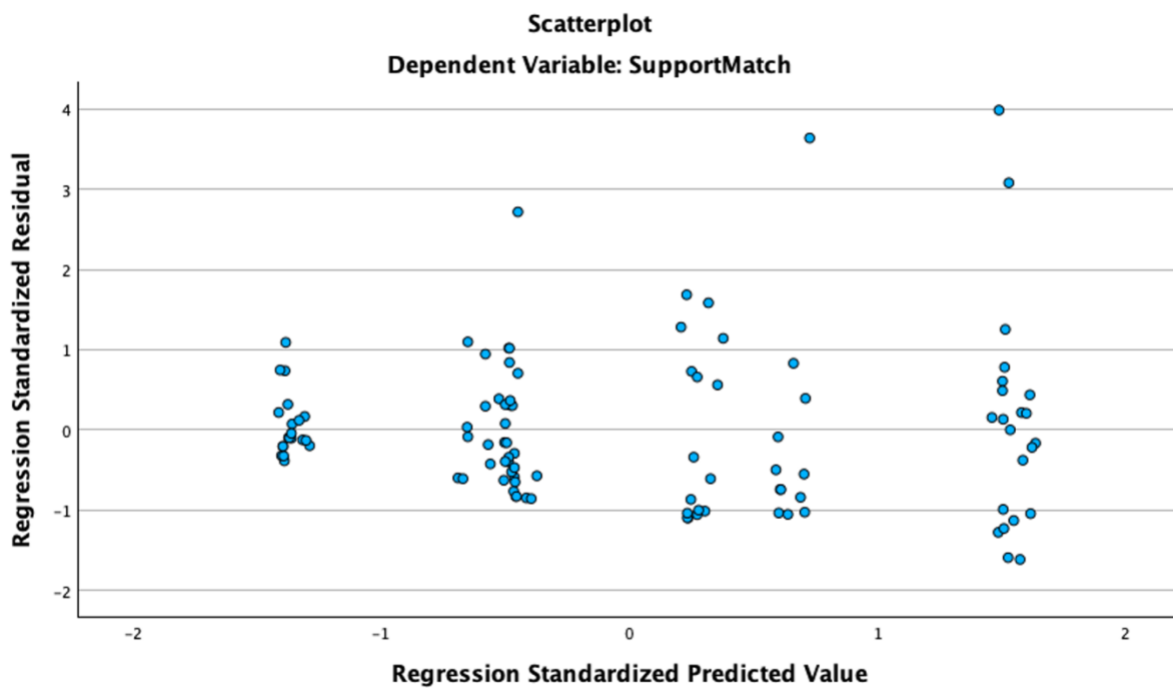


Figure 9: H5 Step 2 assumption of linearity

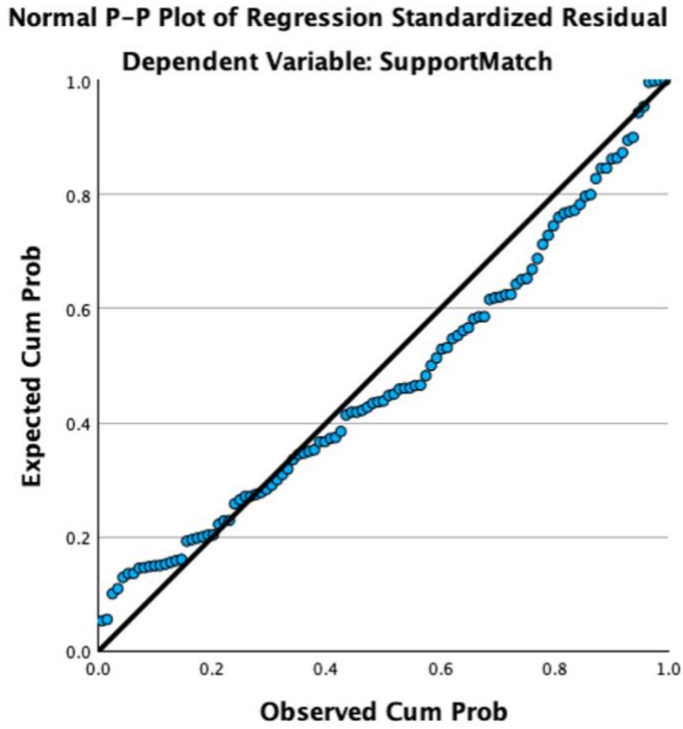


Figure 10: H5 Step assumption of normality of residuals

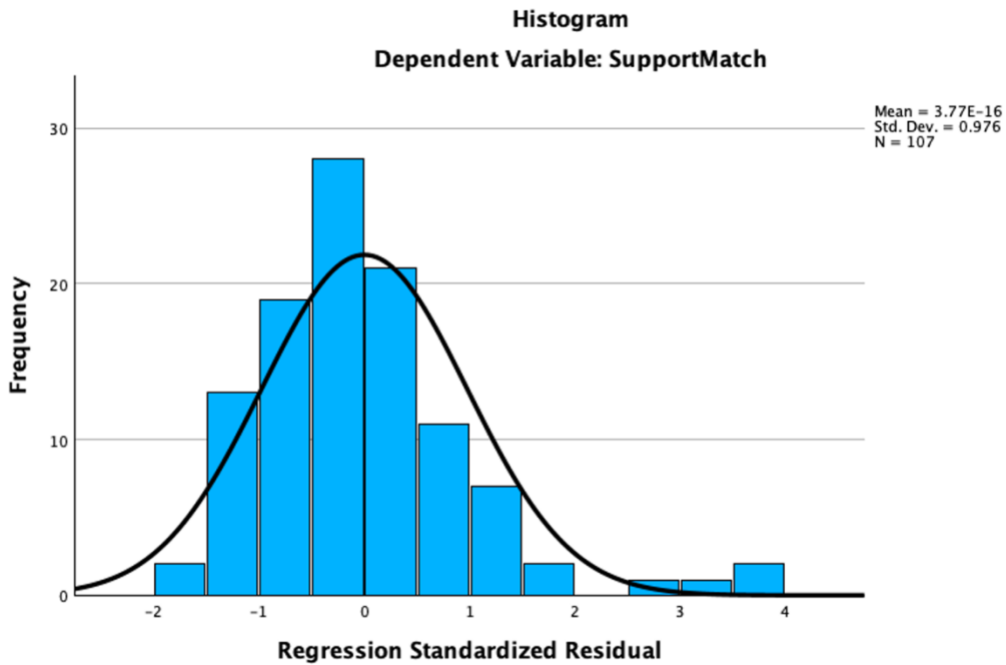


Figure 11: H5 Step 2 assumption of normality of residuals

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	.3164	1.5397	.8836	.40111	107
Std. Predicted Value	-1.414	1.636	.000	1.000	107
Standard Error of Predicted Value	.142	.272	.197	.034	107
Adjusted Predicted Value	.2667	1.5889	.8828	.40316	107
Residual	-1.36475	3.36934	.00000	.82433	107
Std. Residual	-1.616	3.990	.000	.976	107
Stud. Residual	-1.653	4.107	.000	1.006	107
Deleted Residual	-1.42725	3.57060	.00083	.87521	107
Stud. Deleted Residual	-1.667	4.478	.009	1.039	107
Mahal. Distance	1.994	10.033	4.953	2.085	107
Cook's Distance	.000	.205	.010	.027	107
Centered Leverage Value	.019	.095	.047	.020	107

a. Dependent Variable: SupportMatch

Table 6: H5 Step 2 assumption of no influential outliers

Reliability & Robustness

Reliability

Scale: Perceived Emotional Support Received

Case Processing Summary

		N	%
Cases	Valid	120	100.0
	Excluded ^a	0	.0
	Total	120	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.863	5

→ Reliability

Scale: Retention Intention

Case Processing Summary

		N	%
Cases	Valid	120	100.0
	Excluded ^a	0	.0
	Total	120	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.749	2

Reliability

Scale: Expected Emotional Support

Case Processing Summary

		N	%
Cases	Valid	120	100.0
	Excluded ^a	0	.0
	Total	120	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.791	4

Table 7: Reliability & Robustness check

Hypothesis Testing

H1: Emotional Support as a Predictor of Retention

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	On average, how many times per week do you train using this program?, EmoSupport_Received, Age_numeric, Gender_Dummy ^b	.	Enter

- a. Dependent Variable: RetentionIntention
 b. All requested variables entered.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.808 ^a	.652	.639	.79776

- a. Predictors: (Constant), On average, how many times per week do you train using this program?, EmoSupport_Received, Age_numeric, Gender_Dummy
 b. Dependent Variable: RetentionIntention

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	121.828	4	30.457	47.856	<.001 ^b
	Residual	64.915	102	.636		
	Total	186.743	106			

- a. Dependent Variable: RetentionIntention
 b. Predictors: (Constant), On average, how many times per week do you train using this program?, EmoSupport_Received, Age_numeric, Gender_Dummy

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-.023	.466		-.049	.961	-.947	.902		
	EmoSupport_Received	.899	.066	.811	13.627	<.001	.768	1.029	.962	1.039
	Age_numeric	.006	.006	.064	1.081	.282	-.005	.017	.981	1.019
	Gender_Dummy	-.231	.166	-.085	-1.393	.167	-.561	.098	.913	1.095
	On average, how many times per week do you train using this program?	.129	.088	.087	1.460	.147	-.046	.304	.964	1.038

- a. Dependent Variable: RetentionIntention

Table 8: H1: Emotional Support as a Predictor of Retention, with control variables

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	EmoSupport_Received ^b	.	Enter

- a. Dependent Variable: RetentionIntention
- b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.783 ^a	.612	.609	.84135

- a. Predictors: (Constant), EmoSupport_Received

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	131.963	1	131.963	186.424	<.001 ^b
	Residual	83.528	118	.708		
	Total	215.492	119			

- a. Dependent Variable: RetentionIntention
- b. Predictors: (Constant), EmoSupport_Received

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.613	.337		1.821	.071
	EmoSupport_Received	.873	.064	.783	13.654	<.001

- a. Dependent Variable: RetentionIntention

Table 9: H1: Emotional Support as a Predictor of Retention, without control variables

H2: Coach Type and Perceived Emotional Support

➔ **Oneway**

Descriptives

EmoSupport_Received									
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	
					Lower Bound	Upper Bound			
A human coach (e.g., personal trainer, club coach)	55	5.5782	1.08435	.14621	5.2850	5.8713	2.60	7.00	
An AI-based coaching system or app (e.g., Strava, ZING, TriDot, MacroFactor, etc)	38	4.5263	1.31225	.21287	4.0950	4.9576	1.00	7.00	
A combination of both	27	5.0667	.89786	.17279	4.7115	5.4218	3.40	7.00	
Total	120	5.1300	1.20633	.11012	4.9119	5.3481	1.00	7.00	

ANOVA

EmoSupport_Received					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	25.004	2	12.502	9.872	<.001
Within Groups	148.168	117	1.266		
Total	173.172	119			

Homogeneous Subsets

EmoSupport_Received

Tukey HSD^{a,b}

Who is your primary coaching provider? Subset for alpha = .050

(Who plans your training, guides your sessions, or structures your ...)

	N	1	2
An AI-based coaching system or app (e.g., Strava, ZING, TriDot, MacroFactor, etc)	38	4.5263	
A combination of both	27	5.0667	5.0667
A human coach (e.g., personal trainer, club coach)	55		5.5782
Sig.		.103	.130

Post Hoc Tests

Multiple Comparisons

Dependent Variable: EmoSupport_Received
Tukey HSD

(I) Who is your primary coaching provider?		(J) Who is your primary coaching provider?		95% Confidence Interval				
(Who plans your training, guides your sessions, or structures your ...)		(Who plans your training, guides your sessions, or structures your ...)		Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
A human coach (e.g., personal trainer, club coach)	An AI-based coaching system or app (e.g., Strava, ZING, TriDot, MacroFactor, etc)			1.05187*	.23738	<.001	.4883	1.6154
	A combination of both			.51152	.26444	.134	-.1162	1.1393
An AI-based coaching system or app (e.g., Strava, ZING, TriDot, MacroFactor, etc)	A human coach (e.g., personal trainer, club coach)			-1.05187*	.23738	<.001	-1.6154	-.4883
	A combination of both			-.54035	.28325	.141	-1.2128	.1321
A combination of both	A human coach (e.g., personal trainer, club coach)			-.51152	.26444	.134	-1.1393	.1162
	An AI-based coaching system or app (e.g., Strava, ZING, TriDot, MacroFactor, etc)			.54035	.28325	.141	-.1321	1.2128

*. The mean difference is significant at the .050 level.

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 36.794.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Table 10: Coach type and perceived emotional support

H3: 'Coach type' as a moderator between 'Perceived Emotional Support' and 'RetentionIntention'

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Int_EmoSupport_Hybrid, On average, how many times per week do you train using this program?, Age_numeric, Int_EmoSupport_AI, Dummy: Hybrid vs Human, Gender_Dummy, Dummy: AI vs Human, EmoSupport_Centered ^b		Enter

- a. Dependent Variable: RetentionIntention
- b. All requested variables entered.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.816 ^a	.666	.639	.79764	1.879

- a. Predictors: (Constant), Int_EmoSupport_Hybrid, On average, how many times per week do you train using this program?, Age_numeric, Int_EmoSupport_AI, Dummy: Hybrid vs Human, Gender_Dummy, Dummy: AI vs Human, EmoSupport_Centered
- b. Dependent Variable: RetentionIntention

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	124.393	8	15.549	24.440	<.001 ^b
	Residual	62.350	98	.636		
	Total	186.743	106			

- a. Dependent Variable: RetentionIntention
- b. Predictors: (Constant), Int_EmoSupport_Hybrid, On average, how many times per week do you train using this program?, Age_numeric, Int_EmoSupport_AI, Dummy: Hybrid vs Human, Gender_Dummy, Dummy: AI vs Human, EmoSupport_Centered

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients		t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta				Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	4.717	.347			13.585	<.001	4.028	5.406		
	Age_numeric	.008	.006	.080		1.296	.198	-.004	.019	.899	1.112
	On average, how many times per week do you train using this program?	.114	.089	.077		1.282	.203	-.063	.291	.945	1.059
	Gender_Dummy	-.261	.168	-.096		-1.558	.122	-.594	.071	.896	1.116
	EmoSupport_Centered	.899	.110	.811		8.158	<.001	.680	1.118	.344	2.903
	Dummy: AI vs Human	-.160	.202	-.056		-.793	.430	-.560	.240	.674	1.484
	Dummy: Hybrid vs Human	-.350	.209	-.112		-1.680	.096	-.764	.063	.763	1.310
	Int_EmoSupport_AI	.002	.150	.001		.017	.987	-.296	.301	.429	2.332
	Int_EmoSupport_Hybrid	-.242	.225	-.073		-1.075	.285	-.688	.205	.731	1.369

- a. Dependent Variable: RetentionIntention

Table 11: 'Coach type' as a moderator between 'Perceived Emotional Support' and 'RetentionIntention'

H4: Support Match and Retention Intention

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	SupportMatch, On average, how many times per week do you train using this program?, Age_numeric, Gender_Dummy ^b	.	Enter

- a. Dependent Variable: RetentionIntention
- b. All requested variables entered.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.309 ^a	.095	.060	1.28696

- a. Predictors: (Constant), SupportMatch, On average, how many times per week do you train using this program?, Age_numeric, Gender_Dummy
- b. Dependent Variable: RetentionIntention

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17.804	4	4.451	2.687	.035 ^b
	Residual	168.939	102	1.656		
	Total	186.743	106			

- a. Dependent Variable: RetentionIntention
- b. Predictors: (Constant), SupportMatch, On average, how many times per week do you train using this program?, Age_numeric, Gender_Dummy

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	4.664	.557		8.371	<.001	3.559	5.770		
	Age_numeric	.007	.009	.072	.751	.454	-.011	.025	.968	1.033
	On average, how many times per week do you train using this program?	.184	.142	.124	1.295	.198	-.098	.466	.965	1.036
	Gender_Dummy	.033	.269	.012	.123	.902	-.501	.568	.902	1.109
	SupportMatch	-.411	.141	-.284	-2.924	.004	-.690	-.132	.941	1.063

- a. Dependent Variable: RetentionIntention

Table 12: H4: Support Match as a Predictor of Retention, with control variables

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	SupportMatch ^b	.	Enter

a. Dependent Variable: RetentionIntention

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.264 ^a	.070	.062	1.30324

a. Predictors: (Constant), SupportMatch

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.075	1	15.075	8.876	.004 ^b
	Residual	200.417	118	1.698		
	Total	215.492	119			

a. Dependent Variable: RetentionIntention

b. Predictors: (Constant), SupportMatch

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.445	.168		32.432	<.001
	SupportMatch	-.392	.131	-.264	-2.979	.004

a. Dependent Variable: RetentionIntention

Table 13: H4: Support Match as a Predictor of Retention, without control variables

H5: 'SupportMatch' as a Mediator between Coach Type and Retention Intention

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	On average, how many times per week do you train using this program?, Age_numeric, Dummy: Hybrid vs Human, Gender_Dummy, Dummy: AI vs Human ^b	.	Enter

a. Dependent Variable: RetentionIntention
 b. All requested variables entered.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.389 ^a	.151	.109	1.25257

a. Predictors: (Constant), On average, how many times per week do you train using this program?, Age_numeric, Dummy: Hybrid vs Human, Gender_Dummy, Dummy: AI vs Human
 b. Dependent Variable: RetentionIntention

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	28.281	5	5.656	3.605	.005 ^b
	Residual	158.462	101	1.569		
	Total	186.743	106			

a. Dependent Variable: RetentionIntention
 b. Predictors: (Constant), On average, how many times per week do you train using this program?, Age_numeric, Dummy: Hybrid vs Human, Gender_Dummy, Dummy: AI vs Human

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	4.714	.545		8.649	<.001	3.633	5.795		
	Dummy: AI vs Human	-1.078	.292	-.380	-3.691	<.001	-1.658	-.499	.792	1.262
	Dummy: Hybrid vs Human	-.876	.314	-.281	-2.792	.006	-1.499	-.254	.832	1.202
	Gender_Dummy	.098	.257	.036	.382	.703	-.412	.609	.938	1.066
	Age_numeric	.013	.009	.139	1.441	.153	-.005	.031	.909	1.100
	On average, how many times per week do you train using this program?	.153	.139	.103	1.098	.275	-.123	.428	.955	1.047

a. Dependent Variable: RetentionIntention

Table 14: H5: Support Match mediates the relationship between Coaching Type and Retention Intention (path c), with control variables.

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	On average, how many times per week do you train using this program?, Age_numeric, Dummy: Hybrid vs Human, Gender_Dummy, Dummy: AI vs Human ^b	.	Enter

- a. Dependent Variable: SupportMatch
- b. All requested variables entered.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.438 ^a	.191	.151	.84449

- a. Predictors: (Constant), On average, how many times per week do you train using this program?, Age_numeric, Dummy: Hybrid vs Human, Gender_Dummy, Dummy: AI vs Human
- b. Dependent Variable: SupportMatch

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17.054	5	3.411	4.783	<.001 ^b
	Residual	72.030	101	.713		
	Total	89.084	106			

- a. Dependent Variable: SupportMatch
- b. Predictors: (Constant), On average, how many times per week do you train using this program?, Age_numeric, Dummy: Hybrid vs Human, Gender_Dummy, Dummy: AI vs Human

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	.635	.367		1.728	.087	-.094	1.364		
	Dummy: AI vs Human	.799	.197	.408	4.057	<.001	.408	1.190	.792	1.262
	Dummy: Hybrid vs Human	.296	.212	.137	1.397	.166	-.124	.715	.832	1.202
	Gender_Dummy	-.361	.173	-.192	-2.079	.040	-.705	-.017	.938	1.066
	Age_numeric	.001	.006	.017	.185	.853	-.011	.013	.909	1.100
	On average, how many times per week do you train using this program?	.009	.094	.009	.097	.923	-.177	.195	.955	1.047

- a. Dependent Variable: SupportMatch

Table 15: H5: Support Match mediates the relationship between Coaching Type and Retention Intention (path a), with control variables.

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	SupportMatch, Dummy: Hybrid vs Human, Age_numeric, On average, how many times per week do you train using this program?, Gender_Dummy, Dummy: AI vs Human ^b	.	Enter

a. Dependent Variable: RetentionIntention
 b. All requested variables entered.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.422 ^a	.178	.129	1.23881

a. Predictors: (Constant), SupportMatch, Dummy: Hybrid vs Human, Age_numeric, On average, how many times per week do you train using this program?, Gender_Dummy, Dummy: AI vs Human
 b. Dependent Variable: RetentionIntention

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	33.279	6	5.546	3.614	.003 ^b
	Residual	153.464	100	1.535		
	Total	186.743	106			

a. Dependent Variable: RetentionIntention
 b. Predictors: (Constant), SupportMatch, Dummy: Hybrid vs Human, Age_numeric, On average, how many times per week do you train using this program?, Gender_Dummy, Dummy: AI vs Human

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	4.881	.547		8.924	<.001	3.796	5.966		
	Dummy: AI vs Human	-.868	.312	-.306	-2.785	.006	-1.486	-.250	.681	1.468
	Dummy: Hybrid vs Human	-.798	.313	-.256	-2.548	.012	-1.420	-.177	.816	1.226
	Gender_Dummy	.003	.260	.001	.013	.990	-.512	.519	.899	1.112
	Age_numeric	.013	.009	.142	1.490	.139	-.004	.031	.909	1.100
	On average, how many times per week do you train using this program?	.155	.137	.105	1.127	.262	-.118	.428	.955	1.047
	SupportMatch	-.263	.146	-.182	-1.805	.074	-.553	.026	.809	1.237

a. Dependent Variable: RetentionIntention

Table 16: H5: Support Match mediates the relationship between Coaching Type and Retention Intention (path c' & b), with control variables.

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Dummy: Hybrid vs Human, Dummy: AI vs Human ^b	.	Enter

- a. Dependent Variable: RetentionIntention
- b. All requested variables entered.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.390 ^a	.152	.138	1.24946

- a. Predictors: (Constant), Dummy: Hybrid vs Human, Dummy: AI vs Human
- b. Dependent Variable: RetentionIntention

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	32.838	2	16.419	10.517	<.001 ^b
	Residual	182.654	117	1.561		
	Total	215.492	119			

- a. Dependent Variable: RetentionIntention
- b. Predictors: (Constant), Dummy: Hybrid vs Human, Dummy: AI vs Human

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	5.645	.168		33.509	<.001	5.312	5.979		
	Dummy: AI vs Human	-1.159	.264	-.402	-4.396	<.001	-1.681	-.637	.865	1.155
	Dummy: Hybrid vs Human	-.831	.294	-.259	-2.829	.005	-1.412	-.249	.865	1.155

- a. Dependent Variable: RetentionIntention

Table 17: H5: Support Match mediates the relationship between Coaching Type and Retention Intention (path c), without control variables.

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Dummy: Hybrid vs Human, Dummy: AI vs Human ^b	.	Enter

- a. Dependent Variable: SupportMatch
- b. All requested variables entered.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.337 ^a	.113	.098	.86280

- a. Predictors: (Constant), Dummy: Hybrid vs Human, Dummy: AI vs Human
- b. Dependent Variable: SupportMatch

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.147	2	5.573	7.487	<.001 ^b
	Residual	87.098	117	.744		
	Total	98.245	119			

- a. Dependent Variable: SupportMatch
- b. Predictors: (Constant), Dummy: Hybrid vs Human, Dummy: AI vs Human

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	.609	.116		5.235	<.001	.379	.839		
	Dummy: AI vs Human	.704	.182	.362	3.868	<.001	.344	1.065	.865	1.155
	Dummy: Hybrid vs Human	.306	.203	.141	1.508	.134	-.096	.707	.865	1.155

- a. Dependent Variable: SupportMatch

Table 18: H5: Support Match mediates the relationship between Coaching Type and Retention Intention (path a), without control variables.

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	SupportMatch, Dummy: Hybrid vs Human, Dummy: AI vs Human ^b	.	Enter

a. Dependent Variable: RetentionIntention
 b. All requested variables entered.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.417 ^a	.174	.152	1.23893

a. Predictors: (Constant), SupportMatch, Dummy: Hybrid vs Human, Dummy: AI vs Human
 b. Dependent Variable: RetentionIntention

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	37.438	3	12.479	8.130	<.001 ^b
	Residual	178.053	116	1.535		
	Total	215.492	119			

a. Dependent Variable: RetentionIntention
 b. Predictors: (Constant), SupportMatch, Dummy: Hybrid vs Human, Dummy: AI vs Human

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	5.785	.186		31.172	<.001	5.418	6.153		
	Dummy: AI vs Human	-.997	.278	-.346	-3.591	<.001	-1.547	-.447	.767	1.303
	Dummy: Hybrid vs Human	-.760	.294	-.237	-2.587	.011	-1.343	-.178	.849	1.178
	SupportMatch	-.230	.133	-.155	-1.731	.086	-.493	.033	.887	1.128

a. Dependent Variable: RetentionIntention

Table 19: H5: Support Match mediates the relationship between Coaching Type and Retention Intention (path c' & b), without control variables.

H6: 'Athlete type' as a moderates between 'SupportMatch' and 'RetentionIntention'

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Gender_Dummy, Competitive Athlete DUmmy, SupportMatch_Centered, Age_numeric, On average, how many times per week do you train using this program?, Int_SupportMatch_AthleteType ^b	.	Enter

- a. Dependent Variable: RetentionIntention
- b. All requested variables entered.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.379 ^a	.144	.092	1.26450

- a. Predictors: (Constant), Gender_Dummy, Competitive Athlete DUmmy, SupportMatch_Centered, Age_numeric, On average, how many times per week do you train using this program?, Int_SupportMatch_AthleteType
- b. Dependent Variable: RetentionIntention

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26.847	6	4.475	2.798	.015 ^b
	Residual	159.896	100	1.599		
	Total	186.743	106			

- a. Dependent Variable: RetentionIntention
- b. Predictors: (Constant), Gender_Dummy, Competitive Athlete DUmmy, SupportMatch_Centered, Age_numeric, On average, how many times per week do you train using this program?, Int_SupportMatch_AthleteType

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	4.329	.538		8.053	<.001	3.262	5.395		
	Age_numeric	.010	.009	.109	1.128	.262	-.008	.028	.921	1.085
	On average, how many times per week do you train using this program?	.088	.148	.059	.593	.555	-.206	.382	.855	1.170
	SupportMatch_Centered	-.276	.153	-.191	-1.804	.074	-.581	.028	.764	1.309
	Competitive Athlete DUmmy	.417	.287	.149	1.450	.150	-.153	.987	.811	1.233
	Int_SupportMatch_Athlete Type	-.560	.343	-.174	-1.631	.106	-1.241	.121	.751	1.332
	Gender_Dummy	-.056	.268	-.021	-.211	.834	-.587	.475	.883	1.133

- a. Dependent Variable: RetentionIntention

Table 20: 'Athlete type' as a moderates between 'SupportMatch' and 'RetentionIntention'

The survey

Survey Flow

Block: Section 0: Welcome & Consent (1 Question)
Standard: Section 1: Coaching Setup (2 Questions)
Standard: Section 2: Perceived Emotional Support (Support Received) (1 Question)
Standard: Section 3: Perceived Need for Emotional Support (Support Expected) (1 Question)
Standard: Section 4: Relationship Quality (1 Question)
Standard: Section 5: Client Retention (3 Questions)
Standard: Section 6: Athlete Profile (1 Question)
Standard: Section 7: Optional Demographics (5 Questions)

Start of Block: Section 0: Welcome & Consent

Q0 Welcome! This short survey (approx. 3 minutes) is part of a master's thesis at Maastricht University. The purpose is to understand how emotional support in coaching—whether human, AI-driven, or hybrid—influences athletes' experience and retention. Your participation is anonymous. No personal identifiers are collected. Results will only be used for academic research and shared in aggregate form.

I confirm that I am at least 18 years old and consent to participate in this study. (1)

End of Block: Section 0: Welcome & Consent

Start of Block: Section 1: Coaching Setup

Q1 Who is your primary coaching provider? (Who plans your training, guides your sessions, or structures your workouts?)

- A human coach (e.g., personal trainer, club coach) (1)
 - An AI-based coaching system or app (e.g., Strava, ZING, TriDot, MacroFactor, etc) (2)
 - A combination of both (3)
-

Q2 Who provides you with emotional support during your training journey? (Encouragement, motivation, empathy, or understanding)

- A human (e.g., coach, trainer, friend) (1)
- An AI system (e.g., app messages, chatbot) (2)
- Both human and AI support (3)
- Self-coached (no external support) (4)

End of Block: Section 1: Coaching Setup

Start of Block: Section 2: Perceived Emotional Support (Support Received)

Q3 Please rate your agreement with the following statements about your current coaching experience:

	1 = I strongly disagree (1)	2 = I disagree (2)	3 = I slightly disagree (3)	4 = Neutral (4)	5 = I slightly agree (5)	6 = I agree (6)	7 = I strongly agree (7)
I feel understood by my coach or system. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I receive encouragement when I need it. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My coach/system shows genuine care for my progress. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel emotionally supported in my training. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My coach/system helps me stay motivated. (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

End of Block: Section 2: Perceived Emotional Support (Support Received)

Start of Block: Section 3: Perceived Need for Emotional Support (Support Expected)

Q4 Now please tell us how important emotional support is to you personally.

	1 = I strongly disagree (1)	2 = I disagree (2)	3 = I slightly disagree (3)	4 = Neutral (4)	5 = I slightly agree (5)	6 = I agree (6)	7 = I strongly agree (7)
I want my coach/system to understand me emotionally. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Encouragement and empathy are important to me when training. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I need emotional support to stay motivated during my program. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The emotional support I receive from my coach/system matches what I personally need. (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

End of Block: Section 3: Perceived Need for Emotional Support (Support Expected)

Start of Block: Section 4: Relationship Quality

Q5 Please rate the overall quality of your relationship with your coach or coaching system.

	1 = I strongly disagree (1)	2 = I disagree (2)	3 = I slightly disagree (3)	4 = Neutral (4)	5 = I slightly agree (5)	6 = I agree (6)	7 = I strongly agree (7)
I have a strong relationship with my coach/system. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I trust my coach/system to act in my best interest. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

End of Block: Section 4: Relationship Quality

Start of Block: Section 5: Client Retention

Q6 How long have you been following your current training program?

- Less than 2 weeks (1)
 - 2–4 weeks (2)
 - 1–2 months (3)
 - 2–4 months (4)
 - More than 4 months (5)
-

Q7 On average, how many times per week do you train using this program?

- 1x (1)
 - 2x (2)
 - 3–4x (3)
 - 5 or more times (4)
-

Q8 Scale: 1 = Strongly disagree, 7 = Strongly agree

	1 = I strongly disagree (1)	2 = I disagree (2)	3 = I slightly disagree (3)	4 = Neutral (4)	5 = I slightly agree (5)	6 = I agree (6)	7 = I strongly agree (7)
I plan to continue using this training program in the future. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

End of Block: Section 5: Client Retention

Start of Block: Section 6: Athlete Profile

Q9 11. How would you describe yourself as an athlete?

- Recreational (1)
- Semi-professional (2)
- Professional (3)

End of Block: Section 6: Athlete Profile

Start of Block: Section 7: Optional Demographics

Q10 Age

Q11 Gender

- Male (1)
- Female (2)
- Non-binary / third gender (3)
- Prefer not to say (4)

Q12 Country of residence

Q13 What is your current training goal?

Q14 If you have anything to add or additional comments, feel free to include them here.

End of Block: Section 7: Optional Demographics

Official statement of original thesis

By signing this statement, I hereby acknowledge the submitted thesis (hereafter mentioned as “product”), titled:

“Beyond the Human Touch: Emotional Support as a Driver of Retention in AI, Hybrid, and Human Coaching Businesses”

to be produced independently by me, without external help.

Wherever I paraphrase or cite literally, a reference to the original source (journal, book, report, internet, etc.) is given.

By signing this statement, I explicitly declare that I am aware of the fraud sanctions as stated in the Education and Examination Regulations (EERs) of the SBE.

Place:

Maastricht, the Netherlands

Date:

20.06.2025

First and last name:

Noé Wagner

Study programme:

International Business

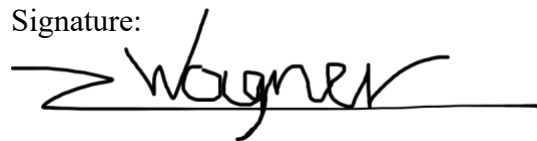
Course/skill:

Entrepreneurship and Business Development

ID number:

I6282638

Signature:



Statement on the use of Generative AI (GenAI) in the master thesis

I hereby certify that I adhered to the SBE guidelines on the use of GenAI tools such as ChatGPT in the master thesis. In the box below, I document how and for what purposes I used GenAI.

During the preparation of this work, I used GenAI for the following purposes:

- Search engine: ChatGPT
- Ideation helper: ChatGPT helped me structure the project
- Text summarizer: ChatGPT helped me analyse articles faster
- Explanation provider: ChatGPT helped me understand articles faster
- Language assistant: ChatGPT helped me get my idea across in a concise manner
- Table editor: /
- Translator: /
- Other: /

After using any tool, I reviewed, quality-checked, and edited the content as needed and take full responsibility for the content of the thesis.

By signing this statement, I explicitly declare that I am aware of the fraud sanctions as stated in the Education and Examination Regulations (EERs) of the SBE.

Place:

Maastricht, the Netherlands

Date:

20.06.2025

First and last name:

Noé Wagner

Study programme:

International Business

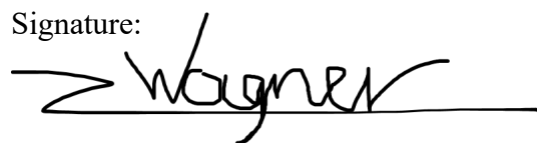
Course/skill:

Entrepreneurship and Business Development

ID number:

I6282638

Signature:

A handwritten signature in black ink that reads "Wagner". The signature is written in a cursive style and is positioned above a horizontal line.

WAGNER Noé

Sustainable Development Goals (SDG) Statement

Name Noé Wagner
 ID I6282638
 Supervisor Dr. Jolien Huybrechts
 Date 20.06.2025

Through the research conducted for this master's thesis, I seek to contribute to one or more of the 17 SDG(s) set forth by the United Nations (<https://www.undp.org/sustainable-development-goals>). Specifically:



SDG Code(s): 3, 8, 9

Explanation (max. 300 words):

This master's thesis contributes to multiple Sustainable Development Goals by examining how different coaching types (human, AI, hybrid) impact perceived emotional support and retention intention among athletes in endurance sports. By exploring the psychological and relational mechanisms that sustain long-term athlete engagement, the research directly supports SDG 3: Good Health and Well-being. Promoting sustained participation in sport and physical activity through effective and emotionally supportive coaching frameworks is vital for improving both physical and mental health outcomes.

Furthermore, the study addresses SDG 8: Decent Work and Economic Growth by generating insights into the business models of SMEs in the endurance sports sector. Understanding how digital and hybrid coaching models can retain clients more effectively helps smaller coaching companies scale sustainably and remain competitive, while also supporting employment and innovation within the sports and wellness economy.

Lastly, this research contributes to SDG 9: Industry, Innovation and Infrastructure by investigating how artificial intelligence can be ethically and effectively integrated into coaching services. It explores how technological change reshapes emotional support delivery, offering pathways for responsible innovation that aligns with both user expectations and long-term service effectiveness.